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Nos. 16-2539, 16-2563

IN THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CISCO SYSTEMS, INC.

Appellant,

v.

INTERNATIONAL TRADE COMMISSION,

Appellee.

- -

ARISTA NETWORKS, INC.

Appellant,

v.

INTERNATIONAL TRADE COMMISSION,

Appellee.

Appeal from the United States International Trade Commission,
Investigation No. 337-TA-944

APPELLANT ARISTA NETWORKS INC.'S OPENING BRIEF

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CERTIFICATE OF INTEREST

Counsel for the Appellant Arista Networks, Inc. certifies the following:

1. The full name of every party or amicus represented by me is: Arista Networks, Inc.

2. The name of the real party in interest: Arista Networks, Inc.

3. Parent corporations and any publicly held companies that own 10% or more of the stock of the party are: None.

4. The names of all law firms and the partners and associates that appeared for the party in the lower tribunal or are expected to appear for the party in this court and who are not already listed on the docket for the current case are:

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The material omitted from the Non-Confidential Brief is information that Cisco designated Confidential Business Information under the ITC protective order (page 30), relevant to claim construction issues in this appeal.

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STATEMENT OF RELATED CASES

Pursuant to Federal Circuit Rule 47.5, counsel states:

(a) No other appeal in or from the same civil action or proceeding in the lower court or body was previously before this or any other appellate court, and

(b) On December 19, 2014, Cisco filed two complaints requesting that the U.S. International Trade Commission commence investigations against Arista under Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337. The Commission instituted Investigation Nos. 337-TA-944 and -945 based on these complaints. The Commission's determination in the -944 Investigation is at issue in this appeal. The target date for completion of the -945 Investigation is March 7, 2017—with the Administrative Law Judge scheduled to issue an Initial Determination by November 7, 2016. The -944 and -945 Investigations involve different and unrelated patents, but the same accused products. In addition, a patent infringement action Cisco filed against Arista is pending and styled *Cisco Systems, Inc. v. Arista Networks, Inc.*, Case No. 5:14-cv-05343 (N.D. Cal. filed Dec. 5, 2014). The N.D. Cal. action involves the same patent as this appeal, and other patents asserted across the two Commission investigations. The N.D. Cal. action is stayed completion of the Commission investigations and any appeals, pursuant to 28 U.S.C § 1659(a).

STATEMENT OF JURISDICTION

Arista appeals the Commission's June 23, 2016 Final Determination and related Commission Opinion, the Commission's June 23, 2016 Limited Exclusion Order and Cease and Desist Order, which are Commission final determinations under 19 U.S.C. § 1337, the ALJ's February 2, 2016 Initial Determination, and the Commission's January 21, 2015 Notice of Institution of Investigation. Appx501-04; Appx505-66; Appx567-71; Appx572-80; Appx581-888; Appx889-901. The Commission's determinations became final when the President, via the U.S. Trade Representative, did not disapprove of them within 60 days. *See* 19 U.S.C. § 1337(j).

This Court has appellate jurisdiction under 19 U.S.C. § 1337(c) and 28 U.S.C. § 1295(a)(6). This appeal was timely filed. *See* 19 U.S.C. § 1337(c).

STATEMENT OF THE ISSUES

1. Did the Commission err in construing "said router configuration data managed by said database subsystem and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database" to require storing router configuration data, and not also user-supplied commands, such that the Commission's violation finding for the '537 patent should be vacated?

2. Did the Commission exceed its authority under Section 337 by issuing remedial orders for infringement of the '537 patent that apply to importations of "components" the Commission never held to infringe, and, if so, should the Commission's orders with respect to such components be vacated?

INTRODUCTION

This patent appeal centers on what information is placed in a network device database when a user types a command to change the device's configuration. The plain claim language requires that the typed commands be saved in addition to data that is derived from those commands. Further, when the patentee amended the claims and made arguments to secure allowance after nine prior rejections, it emphasized language added by the amendment, "executed by a router configuration subsystem before being stored in said database," and distinguished the prior art for not storing commands. The Commission here determined that only the data, and not the commands, need to be stored because the patentee also made other arguments for allowance. But this Court's case law requires courts to credit the prosecution history when it resolves ambiguities in claim language and, in any event, binds a patentee for all clear arguments it makes in prosecution.

The Commission also exceeded its statutory authority, which is tied to "articles that . . . infringe," by issuing remedial orders that apply to the importation of "components" that themselves were never held to infringe. The Commission does not have authority to regulate the importation of noninfringing components that are to be used in connection with subsequent U.S. manufacturing operations.

Arista appeals to correct both legal errors.

STATEMENT OF THE CASE AND FACTS

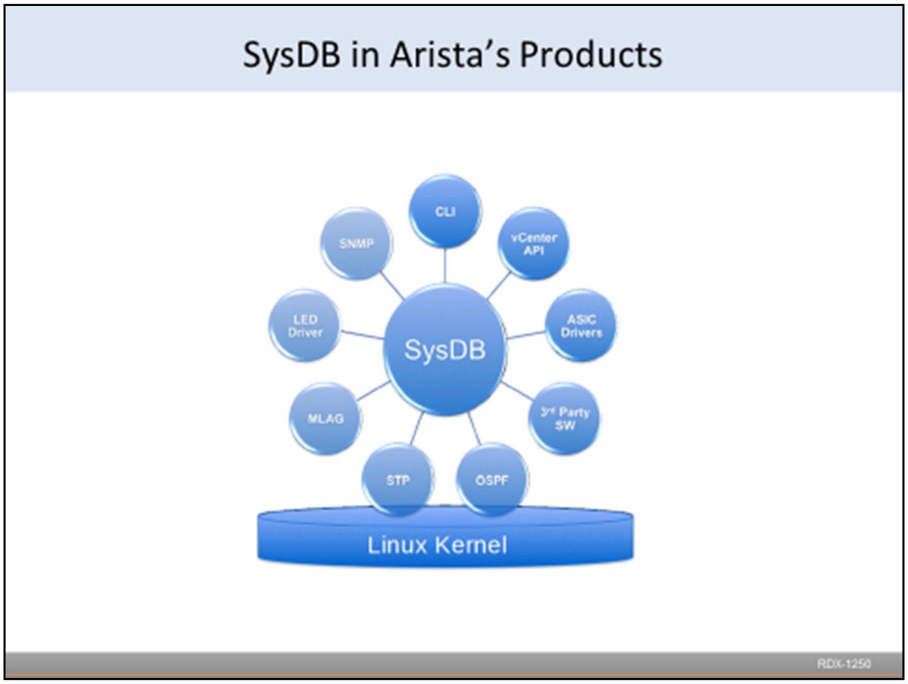
I. The Arista Products and Technology

This case is generally about computer network switches. The central issue on appeal concerns whether a database that coordinates operation of various aspects of the switch needs to store only data about the switch configurations, or also needs to store commands used to carry out changes in the configurations. If the latter, this Court must reverse.

The accused Arista products are network switches and switch components typically deployed in computer data centers. Switches generally connect individual devices in a local area network, and these networks are in turn connected to each other by devices known as routers. Switches and routers receive data packets at one port, and output them at another port so that the packets will move toward their destination.

Back when Arista was founded in 2005, the Internet had evolved to take on more and more data traffic. Digital data proliferated and with it massive datacenters, with rows of servers and equipment filling rooms the size of football fields. These datacenters became the backbone of what is now commonly called "the cloud," which stores videos, photos, documents, games, and any number of software applications that can be accessed by anyone with a connection to the Internet. Arista sought to develop a switching platform that specifically addressed the complexities associated with the environment of massive datacenters.

Arista's switches are not focused on hardware but rather are based on and driven by software. The heart of Arista's switches is the Arista-developed Extensible Operating System (EOS). EOS includes a number of "agents" that are each assigned a specific task and that coordinate with each other through a centralized database called "Sysdb":


SysDB in Arista's Products
CLI
SNMP
vCenter API
LED Driver
SysDB
ASIC Drivers
MLAG
3rd Party SW
STP
OSPF
Linux Kernel
RDX-1250

Appx14025 (RDX-1250); Appx6052 (Q7).

A network administrator can interact with the switch by typing into a command line interface (CLI). Appx6051-52 (Q6-7). For example, an administrator could type a command to change the operating mode of a protocol running on the switch. Appx6053-56 (Q9). The CLI agent parses what the user types and generates data based on the command that describes a desired state of the system, which Sysdb stores. *See* Appx6053-56 (Q9-10), 6060 (Q20). Importantly, Sysdb does not store the configuration command entered by the user. Appx6056 (Q11).

Agents can indicate in advance an interest in certain parameters stored in Sysdb, so that they are notified whenever those parameters change. Appx6056-58 (Q12), 6060 (Q20). For example, a network may use a “spanning tree protocol” to determine how to route packets, and to ensure that they do not get routed in endless circles. To that end, an Arista Spanning Tree Protocol (STP) agent would indicate an interest in any state data that defines the current spanning tree protocol, and if a command typed at the CLI caused the protocol to change, the STP agent would receive new data (but not the command) and would cause the switch to change its operation. Appx6056-58 (Q12-13).

II. The ’537 Patent (U.S. Patent No. 7,162,537)

As suggested by its title, “A Method and System for Externally Managing Router Configuration Data in Conjunction with a Centralized Database,” the ’537 patent purports to improve upon the idea of using a centralized database in a routing device by adding a concept it calls “external management,” performed by a managing subsystem which registers with the centralized database. The patent incorporates by reference three prior Cisco patent applications relating to such a centralized database. *See* Appx703 (“[T]he concept of a centralized database to manage data in an operating system of a network device, [is] a concept that is claimed in [the three other patents[1]]. . . . By contrast, the invention claimed in the ’537 patent is external management of the centralized database.”).

[1] U.S. Patent Nos. 6,704,752, Appx951-67 (*see* Appx902-20 (’537 patent) at 2:42-49, 13:11-18, 14:44-51); 6,728,723, Appx968-83 (*see* Appx902-20 (’537 patent) at 2:66-3:6, 14:10-15), and 6,952,703, Appx984-1002 (*see* Appx902-20 (’537 patent) at 3:2-6, 15:5-11).

A. The Specification

Using a centralized database is one way in which Cisco tried to address problems it identified in the prior art. For example, in prior systems, the "config subsystem" that received user commands would process a command to figure out what information was affected, and would then communicate this information to other subsystems. Appx902-20 ('537 patent) at 1:23-36. This approach prevented modularity, however, because interdependencies between the config subsystem and other subsystems, and between the other subsystems and each other, made communication complicated. *Id.* at 1:37-47.

The '537 patent also purports to address the cumbersome process of making temporary configuration changes—which had to be propagated to all relevant subsystems and then repeated in reverse when the temporary changes were over. *Id.* at 1:48-64, 2:4-27. Other problems arose when a remote user was cut off in the middle of a configuration change. *Id.* at 2:34-41.

The '537 patent addresses these prior art problems using a centralized database, *id.* at 2:55-57, 4:11-13, described in the incorporated '752 application, *id.* at 2:42-55, where the centralized database receives and stores configuration commands from the user along with configuration data for the router:

> The invention receives configuration commands from the user of the router. The invention then communicates the configuration command to the centralized database system. The centralized database system manages a

> storage structure, which is preferably a database tree having a plurality of tuple nodes, where each tuple node contains configuration data for the router.

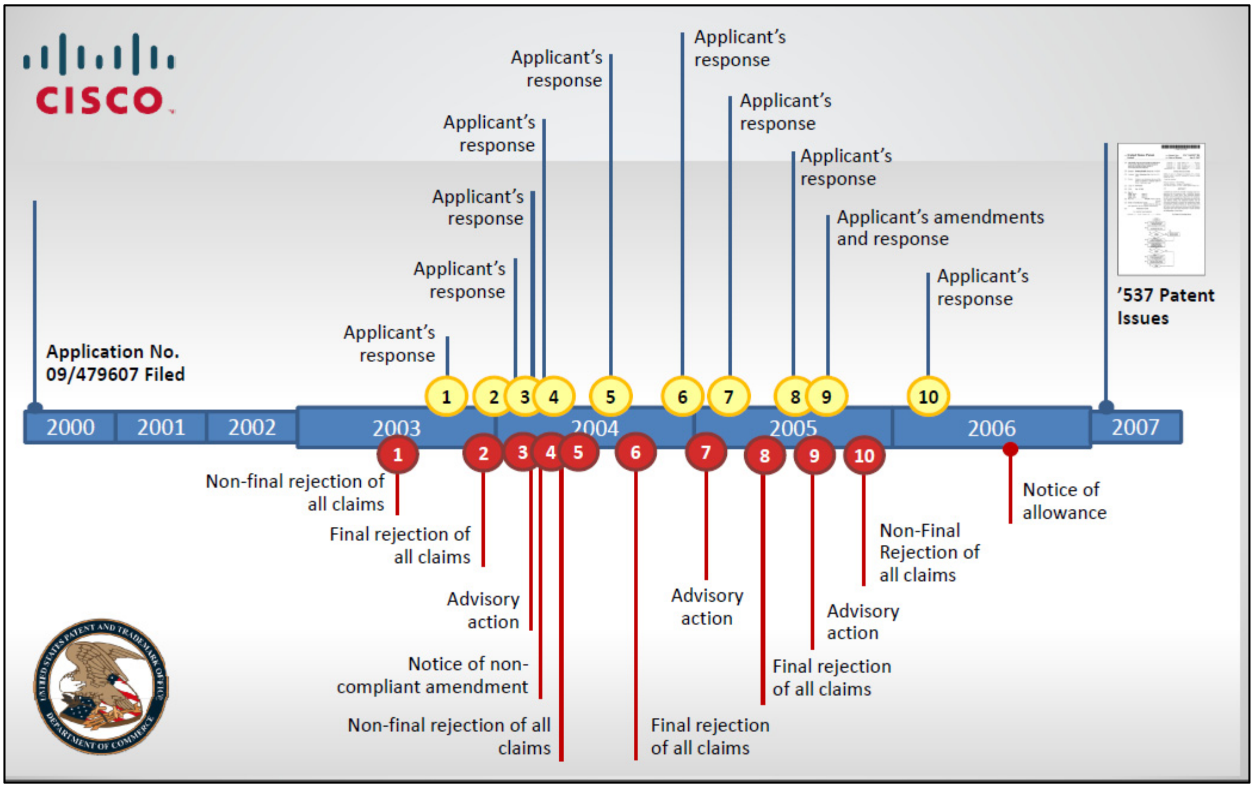
Appx951-67 ('752 Patent) at 3:36-48; *see also id.* at 5:7-12; Appx11061:12-17, 11063:11-21 (Arista's expert Hollingsworth stating that disclosure of communicating commands to a central database indicates "that a configuration command is being stored in the database").

The centralized database approach was not without downsides, however, and the '537 patent offers an improvement over it. Specifically, the '537 patent uses a management subsystem that sends a request to register to "externally manag[e] router configuration data" that would otherwise be the responsibility of the database. Appx902-20 at 9:32-34. Such an approach helps lower the load on the database when there is "a large amount of data or [the data] is changing very fast." *Id.* at 2:58-60. In short, the '537 patent and its incorporated applications describe a centralized database system that stores user commands and some data in a central database, and other data in the management subsystem.

B. The Prosecution History

The '537 patent's prosecution is marked by ten office action responses that pushed back against repeated rejections, until Cisco finally added amendments and arguments that included (among other things) an emphasis on storing user commands in the centralized database. *See generally* Appx1058-1217, 1259-1402, 1412-1584, 1591-96, 1610-14.

The primary reference throughout was a patent to Ciscon (U.S. Patent 5,634,010, Appx921-50). Appx1205-17. In a first office action response, Cisco made minor amendments and argued that Ciscon was missing every claim limitation. Appx1260, 1277-88. The Examiner disagreed and issued a final rejection. Appx1290-1300. For almost two more years, Cisco repeated the same arguments (with no amendments), which the Examiner repeatedly rejected:


CISCO
Application No. 09/479607 Filed
2000
2001
2002
2003
2004
2005
2006
2007
Applicant's response
Applicant's amendments and response
'537 Patent Issues
Non-final rejection of all claims
Final rejection of all claims
Advisory action
Notice of non-compliant amendment
Non-final rejection of all claims
Final rejection of all claims
Advisory action
Final rejection of all claims
Advisory action
Non-Final Rejection of all claims
Notice of allowance

Appx1301-42, 1365-1401, 1412-1518.

In late 2005, Cisco finally changed its approach by adding extensive detail on how its claimed database had to operate:

> 19. (Currently amended) In a router device having a processor and memory, a router operating system executing within said memory comprising:
>
> (a) a database subsystem;
>
> (b) a plurality of client subsystems, each operatively coupled for communications to said database subsystems, one of said client subsystems configured as a managing subsystem to externally manage router data upon issuing a management request to said database subsystem; and
>
> (c) a database operatively coupled to said database subsystem, said database ~~structured and~~ configured to store router configuration data and delegate management of router configuration data to a management subsystem that requests to manage router configuration data, said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database.

Appx1529-30 (underline and strike-through in original);[2] *see also* Appx1519-30.

Accompanying its amendments, Cisco made arguments new and old for allowance. It repeated a previously-rejected argument that Ciscon does not disclose "providing external management services for a database that manages router configuration data." Appx1520. Making a new point, Cisco argued that "Ciscon does not teach router configuration data as stored in a database." Appx

[2] Cisco similarly amended claims 1 and 10 to recite the "said router configuration data managed . . ." clause of limitation 19(c) and added language to their preambles. Appx1523-26.

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1521. Instead, it teaches "applications that inform local routers of what type of objects the applications are interested in sending and receiving," which is "completely unrelated to registration by a management subsystem to provide external management to a database[.]" *Id.* Cisco further argued that the objects described in Ciscon are "not the same as router configuration data," which Cisco cast at this time as "data that results from a router configuration module executing configuration commands issued by a user." *Id.*

These arguments failed. The Examiner rejected all the claims over Ciscon, "maintain[ing] the views as noted previously." Appx1536-51, 1538. In particular, the Examiner rejected Cisco's argument that Ciscon fails to disclose router configuration data derived from configuration commands provided by the user. Appx1539. Importantly, the Examiner noted that Cisco "has made no attempt to show why each and every amendment made to the claims have any sort of patentable novelty or advantage." *Id.*

On February 28, 2006, Cisco changed course and responded with the argument that would finally persuade the Examiner. Appx1553-66, 1572-83. First, Cisco first argued the Examiner had only "***partially*** addresse[d] this claim limitation" that Cisco had added in the previous amendment. Appx1564 (emphasis added), 1573.[3] Cisco then focused the Examiner's attention on the last portion of the limitation, which reads "executed by a router configuration subsystem before being stored in said database":

> Independent claims 1, 10, and 19 (all pending independent claims) were previously amended to include the claim limitation of
>
> transmitting a management registration request by said first managing subsystem to said database subsystem, said registration request indicating router configuration data for which said first managing subsystem is requesting to provide external management services, said router configuration data managed by said database system and derived from configuration commands supplied by a user and **executed by a router configuration subsystem before being stored in said database**
>
> While Examiner partially addresses this claim limitation and pastes previous rejections of previous independent claims that are no longer pending into the body of the Office Action, Examiner asserts that the claims are to be ultimately rejected because insufficient explanation as to their novelty has not been supplied. However, Ciscon fails to disclose teach or otherwise suggest executing configuration commands before storing them in a database. While Examiner cites Ciscon at column 17, line 6- column 18, line 34, specifically column 18, lines 7-11 and 24-27, Applicant cannot find any such limitation in Ciscon.

[3] Cisco's February 28, 2006 amendment was rejected as noncompliant. Appx1569. Cisco resubmitted the same remarks on May 5, 2006. Appx1572-83. This brief will refer to the February 2006 response.

Appx1564 (bold in original, highlighting added). By arguing that "Ciscon fails to disclose teach or otherwise suggest ***executing configuration commands before storing them in a database***," Cisco resolved any ambiguity as to the scope of its claims: they were written to cover storing configuration commands in addition to the configuration data, and this requirement was important to distinguishing the prior art. *Id.* (emphasis added).

This reference to storing commands was not an isolated, passing reference. Cisco reinforced the importance of storing commands by explaining that a portion of Ciscon that the Examiner cited teaches storing data, not commands. *See* Appx1565 ("Applicant submits that [Ciscon's data] structures here are not commands, and can in no way be construed to be equivalent to router configuration commands."). Making a third reference to user-entered commands, Cisco disputed that Ciscon discloses "executing a command that configures a router." *Id.*

Finally, Cisco's fourth reference highlighted that the novelty of the added limitation was incorporating a database into managing user-supplied commands: "As the present invention performs this claim limitation to manage router configuration data in conjunction with a centralized database, the ***novelty here*** is that ***this claim limitation*** provides a way to ***incorporate a database into managing user-supplied configuration commands***, not properties of data structures, to more effectively configure routers deployed in a network." *Id.* (emphases added).

Only after Cisco repeatedly noted that the database stored commands did the Examiner allow the claims “in view of Cisco’s arguments.” Appx1592-94; *see also* Appx1610-11.

III. The Imported “Articles”—Network Switches and Components

A second issue on appeal concerns the manner in which Arista’s products are imported. In general, there are two types of Arista switches, “fixed” switches and “modular” switches. Appx6087, 6089-90 (Q6). The main difference is that modular switches allow customers to expand switching capacity by plugging in additional switching hardware, such as line cards that provide input/output ports and fabric cards that connect the line cards to one another. Appx6090 (Q7). In contrast, the capacity of fixed switches cannot be expanded. Examples of Arista’s modular and fixed switches are shown below.

Modular Switch

Fixed Switch

Modular switches generally resemble large racks with spaces for inserting and removing modular components. Although fixed switches have a fixed amount of switching capacity, they do make use of some "modular" components, namely fans and power supplies that can be removed and replaced as necessary.[4] Appx6105-06 (Q83-84).

The Investigation concerned two types of imported "articles": (1) fixed switches assembled outside the U.S. and (2) switch components imported into the U.S. for domestic manufacturing or for spare parts.[5]

Fixed Switches Assembled Outside the U.S.: As to the first type of imported "article," fixed switches have been assembled outside of the U.S. and imported into the U.S. as fully-assembled units. At the time of the hearing, they were imported without EOS software, which is loaded in the U.S. in a final manufacturing step before the switches are shipped to U.S. customers. Appx6099 (Q54-55). The parties and Commission have referred to these articles as "Blank Switches," because they lack EOS software when imported.[6] *E.g.*, Appx526-27.

[4] The images do not show the fans and power supplies, which would be inserted at the back of the particular switches that are shown.

[5] Appx6091-97 (Q19-43), 6104-13 (Q77-110); Appx4858. Before 2009, all of Arista's network switches were made in the U.S. Appx6103 (Q75).

[6] Cisco disputed this issue, maintaining that the fully-assembled network switches were loaded with EOS software at the time of importation. The Commission took no position on the dispute, but assumed for purposes of its findings that the switches were indeed "blank" (i.e., lacked EOS software) at the time of importation, and thus conducted its infringement analysis with respect to "Blank Switches." Appx511, 515. Because all Cisco's infringement allegations required the presence of EOS software, the Commission analyzed infringement

Components: The second type of imported "article" is components imported for either domestic manufacturing or spare parts. Some of these imported components are "modular" in the sense that they can be plugged directly into a compatible network switch—including fan modules for cooling, power supplies, line cards, and fabric modules. Appx6090 (Q7), 6105-06 (Q84), 6111-13 (Q107-08). Others are lower-level components—such as bare printed circuit boards (PCBs),[7] metal chassis used as enclosures, and CPU cards that provide processing capability. These lower-level components are assembled into network switches or modular components within the U.S. Appx6104-13 (Q77-110); Appx4858. This brief refers collectively to all of Arista's imported components with a capital "Components" for ease of reference, and to avoid confusion with the statutory term "component" that appears in 35 U.S.C. § 271(c).

IV. Proceedings Before the ALJ and Commission

This proceeding was initiated on six patents as Investigation No. 337-TA-944. The evidentiary hearing was held on September 9-16, 2015, and the ALJ

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only in the context of indirect infringement, based upon the subsequent loading of EOS software onto the Blank Switches after importation. *Id.*

[7] Bare PCBs are flat boards that have wiring to connect the components, and to which the components (resistors, capacitors, integrated circuit chips, etc.) are mounted. Appx6091-92 (Q14, 22), 6106 (Q85). The PCBs do not include the electronic components or any related circuitry; for domestically-manufactured products, the components are mounted onto the boards within the U.S. Appx6104 (Q77-79), 6108-10 (Q91-93, 99-101).

issued an Initial Determination ("ID") on February 2, 2016. Cisco withdrew one patent before the hearing, and the ALJ found no violation for two others, U.S. Patents 7,340,597 and 7,290,164. Appx885. The ALJ found a violation for the '537 patent and other patents that are related to each other and concern private virtual LAN technology. *Id.* Arista petitioned the Commission for review on various issues, including claim construction and infringement issues for the '537 patent. Appx12972, 12985-13037.

On claim construction, the Commission's June 23, 2016 Opinion affirmed the ALJ's decision (which included no analysis) that the following limitation requires storing router configuration data in said database but does not require storing commands:

> said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database.

Appx512.[8] The Commission looked to some parts of the specification but not others. It found that "the focus of the '537 patent is on the storage of configuration data" and "the purpose of the invention is to manage router configuration data."

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[8] The Commission appeared to believe that the limitation had to cover storing data or commands, not both, despite Arista's argument that another part of the limitation requires storing configuration data. Appx12994.

Appx513. It concluded from the following passage that, although configuration commands in the patent received from the user are executed, they are not stored:

> The config subsystem 28 carries out configuration commands for a user of the router, ***executing the configuration command*** received from the user and providing configuration information to the user of the router upon request from the user, among other things. As discussed above, this ***router configuration information is stored*** and managed by the sysDB 26 in the sysDB tree 42.

Id. (citing '537 patent at 8:46-52) (emphases by the Commission); *id.* ("[I]t is the router configuration information, which is stored[.]"). But the Commission failed to address the '537 patent's teachings that commands are sent to the centralized database and the evidence that they would be stored there. Appx902-20 at 2:51-53; Appx951-67 ('752 Patent) at 3:36-38, 5:7-12; Appx11059:14-11060:7 (Arista's expert Hollingsworth), 11061:12-17 (same), 11063:11-21 (same).

The Commission similarly looked to some, but not all, of the prosecution history in finding there was no "clear and unmistakable disclaimer." Appx513. Despite recognizing that Cisco distinguished the Ciscon reference for "'fail[ing] to disclose . . . executing configuration commands before storing them in a database,'" the Commission concluded that Cisco "was not distinguishing Ciscon on the basis of commands being stored in the database" because Cisco made additional arguments regarding Ciscon's lack of commands or "execution of user-supplied configuration commands resulting in configuration data that is stored in a database." Appx513-14 (brackets added; ellipses by the Commission). But the Commission did not address Cisco's statement that, "[a]s the present invention performs this limitation to manage router configuration data in conjunction with a centralized database, the novelty here is that this claim limitation provides a way to incorporate a database into managing user-supplied configuration commands, not properties of data structures, to more effectively configure routers deployed in a network." Appx514. The Commission likewise failed to address Arista's evidence that "incorporating a database into managing user-supplied configuration commands" refers to storing such commands in the database. *See* 11058:3-11059:2 (Arista's expert Hollingsworth).

The Commission also reviewed the ID's infringement finding. Appx515. According to the ID, the accused products store router configuration data in the centralized database. Appx518. Alternatively, "if the claims are construed to require storage of user commands, the ID also finds that the accused product store user commands." *Id.*; Appx665. Given that the Commission affirmed the ALJ's construction as requiring storing router configuration data, and not commands, the Commission adopted his findings of infringement under this construction. Appx518. The Commission took no position, however, "on the ID's alternative findings that Arista also infringes when commands are stored." *Id.*

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With respect to the Components, the Commission declined to decide whether the Components infringe the asserted claims of the ’537 patent. Appx527. Such analysis was unnecessary, it said, because it had determined that the importation of fully-assembled network switches violated Section 337, and that finding was purportedly sufficient to make the Components subject to its remedial orders as well:

> Although Arista argues that each of the imported components must also be material to the invention, the Commission ***need not reach*** this issue. If Arista attempts to ***circumvent a Commission remedy by importing only the components*** of the accused products for reassembly into complete functional switches, it ***would still be in violation of section 337*** because the Commission finds that the Blank Switches and the fully assembled complete switches indirectly infringe and the accused switch components are covered by this finding.

Id. (emphases added). Although this discussion appears in a section of the Opinion discussing contributory infringement, the Commission also failed to find that the importation of any Component induces infringement. Appx528.

Thus, the Commission did not address Arista’s evidence that the Components do not infringe contributorily because they are generic hardware elements and not a “material part of the invention” set forth in the ’537 patent’s claims. 35 U.S.C. § 271(c); Appx13021-24; Appx5886, 5980-82 (Q154-59). For example, a power supply merely supplies electricity to the network switch and is not materially related to the specific software technique for “externally managing router configuration data in conjunction with a centralized database," recited in the claims of the '537 patent. Appx5982 (Q159); Appx902-920 ('537 patent) at Abstract. Similarly, the Commission did not respond to Arista's showing that, because the Components have no connection to the invention set forth in the claims, and by extension the alleged infringement, their importation does not encourage infringement of the '537 patent under 35 U.S.C. § 271(b). Appx13024; Appx133563, 13408-12.

Despite declining to reach whether the Components infringe, the Commission issued remedial orders for infringement of the '537 patent that apply to importations of "components." The Limited Exclusion Order (LEO) excludes and the Cease and Desist Order (CDO) prohibits conduct related to "[n]etwork devices, related software and components thereof that infringe one or more of [claims] 1, 2, 8-11, and 17-19 of the '537 patent." Appx568; Appx573.

SUMMARY OF THE ARGUMENT

Claim Construction: The Commission erred by determining that the "configuration commands supplied by a user" recited in all the asserted claims do not need to be stored by the recited "database system." To reach this result, the Commission ignored standard grammar rules and essentially rewrote the limitation to insert punctuation that simply is not present. The phrase, "configuration commands supplied by a user and executed by a router configuration subsystem

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before being stored in said database," says that configuration commands supplied by a user are executed and stored in a database. Other claim language ("said router configuration data managed by said database system") already requires storing router configuration data so that the Commission's construction renders this later language superfluous.

Moreover, the prosecution history thoroughly and unequivocally resolves any ambiguity and shows that storing commands is required. After nine unsuccessful attempt to distinguish the Ciscon art, Cisco added the key limitation that configuration commands must be "***executed by a router configuration subsystem before being stored in said database***," and argued that "Ciscon fails to disclose teach or otherwise suggest executing configuration commands before storing them in a database." *See* Appx1564 (emphasis in original). The Commission erred in concluding this statement was not binding simply because Cisco made additional statements for patentability. Arista's products do not infringe because they do not store user-entered configuration commands.

Exclusion of Components Never Found To Infringe: The Commission exceeded its Section 337 authority by issuing remedial orders that apply to importations of "components" it never held to infringe. The plain language of the statute constrains the Commission's authority to investigate and deal with "articles that . . . infringe." 19 U.S.C. § 1337(a)(1). Here, the Commission found infringement by only fully-assembled network switches, loaded with EOS software after they are imported into the U.S. Appx525-28. The Commission determined that its infringement finding as to fully-assembled network switches was enough to cover all "components thereof" in its remedial orders, without needing to find whether the components themselves are actually "articles that . . . infringe." Appx527-28. Such a reading of the statute that contradicts the statutory language receives no deference, and the Commission's remedial orders cannot stand.

In addition, because the Commission will need to address contributory and induced infringement on remand, in the interests of efficiency and judicial economy, this Court should address fundamental errors in the Commission's understanding of those legal doctrines.

ARGUMENT

I. Standard of Review

Claim construction in this appeal is reviewed *de novo* because the Commission relied on only intrinsic evidence in reaching its claim construction. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837–38 (2015).

The Commission's interpretation of its authority under Section 337 is reviewed under the *Chevron* framework. *Suprema, Inc. v. Int'l Trade Comm'n*, 796 F.3d 1338, 1346 (Fed. Cir. 2015) (*en banc*) (citing *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842-43 (1984)). Under that framework, this Court asks (1) "whether Congress has directly spoken to the precise question at issue." *Id.* If so, the inquiry ends, and the Court gives effect to Congress's unambiguous intent. *Id.* If not, the Court asks "whether the agency's answer [to the precise question at issue] is based on a permissible construction of the statute." *Id.* (quoting *Chevron*, 467 U.S. at 843).

II. The Commission's Infringement Finding on the '537 Patent Should Be Vacated

A. The Commission's Construction of the "Storing Commands" Limitation Is Contrary to the Intrinsic Evidence

Analysis of a disputed limitation begins with the words of the claim as one of ordinary skill would have understood them. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*). One also consults "the intrinsic record to determine whether the context in which the disputed term sits shines light on its meaning." *Wi-LAN USA, Inc. v. Apple Inc.*, _ F.3d _, No. 2015-1256, 2016 WL 4073324, at *5 (Fed. Cir. Aug. 1, 2016) (citing *Phillips*, 415 F.3d at 1315).

The prosecution history "provides evidence of how the PTO and the inventor understood the patent" and "can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution." *Phillips*, 415 F.3d at 1317; *see also Fenner Invs., Ltd. v. Cellco P'ship*, 778 F.3d 1320, 1323 (Fed. Cir. 2015) (providing that "[a]ny explanation, elaboration, or qualification presented by the inventor during patent examination is relevant" to claim construction). Statements made during prosecution need not amount to unmistakable disclaimer for them to impact claim construction. *See Indacon, Inc. v. Facebook, Inc.*, 824 F.3d 1352, 1357-58 (Fed. Cir. 2016) (noting that "the patentees' description of their invention during prosecution . . . bolsters the district court's constructions" even through the court did "not determine whether the patentees' statements during prosecution rise to the level of clear and unmistakable disclaimer"); *Shire Dev., LLC v. Watson Pharms., Inc.*, 787 F.3d 1359, 1366 (Fed. Cir. 2015) ("Although the prosecution history statements do not rise to the level of unmistakable disavowal, they do inform the claim construction.").

The Commission committed legal error in construing the following limitation, which is marked and colored here to show terms that are modified (bold color) and that modify (non-bold color):

> ***said router configuration data*** [1] managed by said database system and [2] derived from ***configuration commands*** [a] supplied by a user and [b] executed by a router configuration subsystem before being stored in said database.

Appx902-20 ('537 patent) at 15:34-37, 16:60-63, 18:35-39.

The key dispute is whether "before being stored in said database" modifies "commands supplied by a user" or modifies "router configuration data." The intrinsic evidence overwhelmingly supports a plain reading that requires storing commands.

1. The Plain Language Requires Storing User-Supplied Commands

The claim recites two actions for router configuration data (noted in red above): (1) that it be "managed" by the database system, and (2) that it be "derived" from configuration commands. The claim then recites other actions with respect to the configuration commands (noted in green above): (a) that they be "supplied" by a user, and (b) that they be "executed . . . before being stored in said database." By applying ordinary meaning and grammar, the commands plainly are stored in said database, after they are executed.

The verb "executed" refers to the object immediately preceding it—i.e., configuration commands. Notably, the patent and persons of skill in the art would never refer to "data" as being executed; rather, commands are executed.[9] Thus there is no dispute that "configuration commands . . . executed by a router configuration subsystem" should be read as a single unit. Because the "before being stored" language comes immediately after this clause, grammar dictates that it modifies "configuration commands."

[9] *See* Appx902-920 ('537 patent) at 8:48 (describing "executing the configuration commands received from the user"); Appx5610, 5633 (Q79) (Arista's expert Hollingsworth) ("Data cannot not [sic] be executed; only commands can be executed."); Appx10100:22-101:3 (Cisco's expert Almeroth) ("Those configuration commands supplied by a user and executed by a router configuration subsystem, that's correct.").

Specifically, the prepositional phrase "before being stored in said database" acts as an adverb that, absent an intervening word, clause, or punctuation to redirect the sentence, modifies the verb immediately preceding it—i.e., "executed." *See* Strunk and White, *Elements of Style* (4th ed. 2000) 30 ("Modifiers should come, if possible, next to the words they modify."); *Chicago Manual of Style* (15th ed. 2003) 188 ("A prepositional phrase with an adverbial . . . function should be as close as possible to the word it modifies . . . ."). Thus, the thing "being stored" is the subject of the verb "executed," namely, the configuration commands.

The Commission's contrary interpretation that "router configuration data, not user-supplied commands" are stored, Appx514, essentially rewrites the claim language—for example, by inserting commas to set off the phrase "supplied by a user and executed by a router configuration subsystem":

> said router configuration data managed by said database system and derived from configuration commands**[,]** supplied by a user and executed by a router configuration subsystem**[,]** before being stored in said database.

That was legal error given the lack of commas, dashes, or other punctuation to support the idea that "before being stored" should modify a phrase much earlier in the limitation rather than the phrase immediately next to it, as logic and grammar rules require. *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004) ("[C]ourts may not redraft claims . . . ."); *see also Toshiba Corp. v. Juniper Networks, Inc.*, 248 F. App'x 170, 174 (Fed. Cir. 2007) (unpublished case) (holding, in the phase "'policy information indicating a permitted neighboring node/network from which a packet transfer by the label switching is to be permitted[,]' . . . [t]he claim language 'from which' modifies the 'neighboring node/network,' not the 'policy information.' If the patentee desired the latter construction, it would have used commas to set off the phrase 'indicating a permitted neighboring node/network.' Lacking grammatical signals to the contrary, we hold the claim more logically supports a construction requiring a transfer *from* a neighboring node or network." (emphasis in original)).

Moreover, if "before being stored in said database" modifies "router configuration data," the former phrase would be redundant of "router configuration data managed by said database system." This "managed by" requirement necessarily includes storing the router configuration data in said database because, as Cisco has conceded, the concept of "managing" includes storing. *See* Appx10136:24-10137:2 (Cisco's expert Almeroth stating "Maintain is really a synonym of manage."), 11040:24-11041:2 (same stating "Maintaining certainly includes storage."); Appx10237:4-8 ('537 inventor Kathail stating "Q: At a minimum, [maintaining] involves storing; correct? A: Yes."); *see also* Appx1447 ("Because the use of a centralized database is avoided, there is no teaching in Ciscon of managing subsystems offering help in the form of processing and storage to a centralized database.").

Because the language "router configuration data managed by said database system" already requires the data to be stored in a database, "before being stored in said database" refers to something else—i.e., the user-supplied commands. *Cat Tech LLC v. TubeMaster, Inc.*, 528 F.3d 871, 885 (Fed. Cir. 2008) ("Claims are interpreted with an eye toward giving effect to all terms in the claim."); *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.").

Thus, the claim language itself, interpreted using ordinary meaning and rules of grammar, compels the conclusion that the claim requires configuration commands to be executed before they are stored in said database.

2. The Written Description Discloses Sending User-Supplied Commands to the Centralized Database Where They Are Stored

The written description specifically describes sending configuration commands to the centralized database, which would then, according to its core function, store them. Appx902-20 at 2:51-53 ("The sysDB receives configuration commands from various IOS subsystems."); Appx11059:14-11060:7 (Arista's expert Hollingsworth). The patent makes no secret that "[t]he present invention employs a centralized sysDB which handles storage and retrieval tasks normally assigned to various subsystems," Appx902-20 at 4:11-13, such as the configuration subsystem, which handled storing commands in prior art systems, *see id.* at 1:29-30 ("A config command issued by the user is received by the config subsystem and processed therein.").

The '537 patent further explains, through its incorporated disclosure, that the centralized database system receives and stores configuration commands from a user along with router configuration data:

> The invention receives configuration commands from a user of a router. ***The invention then communicates the configuration command to the centralized database system.*** The centralized database system manages a storage structure, which is preferably a database tree having a plurality of tuple nodes, where each tuple node contains configuration data for the router.

Appx951-67 ('752 Patent) at 3:36-38 (emphasis added); *see also* Appx11063:11-21 (Arista's expert Hollingsworth stating that disclosure of communicating commands to a central database indicates "that a configuration command is being stored in the database" because "[a] database generally and principally stores information"). In fact, [redacted][10]

[10] Appx10242:3-8 ([redacted] stating [redacted]); Appx4975:12-21 (same stating [redacted] Appx4978:6-11, 4979:10-15 (same stating that [redacted]

The Commission did not address the teachings that commands are sent to the centralized database and the evidence that they would be stored there. In stating that "the focus of the '537 patent is on the storage of configuration data" and "the purpose of the invention is to manage router configuration data," Appx513, the Commission passed by the patent's teaching that "[t]he present invention is a method and system for managing data externally ***in conjunction with a centralized information provider or database system***," and its teaching (via three incorporated patents) that describes how the centralized database works, Appx902-920 ('537 patent) at 3:42-44 (emphasis added), Abstract; *id.* at 2:42-49, 2:66-3:6, 3:2-6, 13:11-18, 14:10-15, 14:44-51, 15:5-11; *id.* at 4:11-13.

The Commission concluded that the commands are not stored, citing only this passage which says that configuration information is stored but does not say configuration commands are not:

> The config subsystem 28 carries out configuration commands for a user of the router, ***executing the configuration command*** received from the user and providing configuration information to the user of the router upon request from the user, among other things. As discussed above, this ***router configuration information is stored*** and managed by the sysDB 26 in the sysDB tree 42.

Appx513 (citing '537 patent at 8:46-52) (emphasis by the Commission). Indeed, nothing in the '537 patent says that the centralized database does not store user commands, and the disclosure viewed in total teaches that the commands are sent to the centralized database and stored there.

3. The Prosecution History Unequivocally Requires Storing Commands

The prosecution history conclusively shows that the limitation requires the database to store the commands. *See Board of Regents of Univ. of Tex. Sys., v. BENQ Am. Corp.*, 533 F.3d 1362, 1369 (Fed. Cir. 2008) ("[T]he prosecution history may be given substantial weight in construing a term where that term was added by amendment.").

This limitation was critical to allowance—it was added after nine separate Cisco attempts to distinguish the Ciscon reference based on the reference's alleged failure to show externally managing router configuration data. *E.g.*, Appx1398-99 ("Registration of interest as described in Ciscon is completely unrelated to registration by a management subsystem to provide external management to a database."). When Cisco first added the limitation, its arguments in support of allowance focused on Ciscon's alleged failure to show external management of "router configuration data as stored in a database." Appx1520-21, 1523. Yet, the Examiner still did not allow the claims. Appx1538-39.

So Cisco changed course and added a new argument that Ciscon did not disclose storing the commands themselves, asserting that the Examiner only "***partially*** addresse[d] th[e] claim limitation." Appx1564 (emphasis added).

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Specifically, Cisco emphasized the limitation's language of "executed by a router configuration subsystem before being stored in said database," and argued that "Ciscon fails to disclose teach or otherwise suggest ***executing configuration commands before storing them in a database***." *Id.* (emphasis added).[11] The word "them" in this argument undoubtedly refers to configuration commands.[12]

Cisco again referenced storing commands in the centralized databased when it described the invention's novelty:

> As the present invention performs this limitation to manage router configuration data ***in conjunction with a centralized database***, the ***novelty here is that this claim limitation provides a way to incorporate a database into managing user-supplied configuration commands***, not properties of data structures, to more effectively configure routers deployed in a network.

Appx1565 (emphases added). Significantly, Cisco was rebutting the Examiner's argument that it failed to explain the novelty of the new limitation. *Id.*; *see also* Appx1564 ("Examiner asserts that the claims are to be ultimately rejected because insufficient [sic] explanation as to their novelty has not been supplied [sic]. ***However***, Ciscon fails to disclose . . . executing configuration commands before storing ***them*** in a database." (emphases added)); Appx1538-39 (noting Cisco "has

[11] Cisco reinforced this point by explaining that a portion of Ciscon that the Examiner had cited teaches storing data, not commands. *See* Appx1565.

[12] Cisco's prosecuting attorney confirmed his intent to distinguish the prior art on the grounds that it did not store configuration commands in a database. Appx5138, 5179 (at 165:7-19).

made no attempt to show why each and every amendment made to the claims have any sort of patentable novelty or advantage").

Cisco thus argued that its invention included managing user-supplied configuration commands by storing them in the database. In the context of the patent and prosecution history, to "incorporate a database into managing user-supplied configuration commands" means that the commands are stored in the database. Appx11058:3-11059:2 (Arista's expert Hollingsworth stating: "Considering one of the principal purposes of a database is to store things, . . . incorporating a database into an activity would indicate that the commands were being stored."). Cisco's representations about the novelty of its claimed invention bind Cisco now. *See Wi-LAN*, 2016 WL 4073324, at *10 ("A patentee cannot make representations about claim language during prosecution to avoid prior art and then escape these representations when trying to show infringement.").

The progress of prosecution leading up to allowance further demonstrates that the claims had to require storing commands, and not just data, for the Examiner to allow them. Specifically, the claims always recited storing router configuration data in the database.[13] However, this requirement was not enough to

[13] *See* Appx1103 (reciting "said database structured and configured to store router configuration data"); Appx10116:6-18 (Cisco's expert Almeroth), 10124:19-25 (admitting that "router configuration data had to be stored in a database, it was in the claim from day 1").

convince the Patent Office to allow the claims, even after Cisco added the relevant limitation and argued that the new limitation too required storing configuration data in a centralized database, which distinguished the claims from the prior art. *E.g.*, Appx1520-21 (arguing "Ciscon does not teach router configuration data as stored in a database"); Appx10116:6-10117:22 (Cisco's expert Almeroth). Only when Cisco added, in its final response, the argument that the limitation requires storing ***commands*** did the Examiner allow the claims. *See* Appx1523, 1564, 1592. In context then, Cisco's other argument that "there is no disclosure, teaching, or suggestion in Ciscon that execution of user-supplied configuration commands results in configuration data that is stored in a database[,]" Appx1565, establishes simply that the centralized database stores router configuration data ***in addition to*** commands.

The Commission wrongly focused on additional arguments Cisco made for allowance. Appx513-14. Specifically, the Commission found that Cisco "was not distinguishing Ciscon on the basis of commands being stored in the database" because it made other arguments about storing data:

> Finally, there is no disclosure, teaching, or suggestion in Ciscon that ***execution of user-supplied configuration commands results in configuration data that is stored in a database***. As the present invention performs this limitation to manage router configuration data in conjunction with a centralized database, the novelty here is that this claim limitation provides a way to incorporate a database into managing user-supplied configuration

> commands, not properties of data structures, to more effectively configure routers deployed in a network. Directing Examiner's attention to the whole of FIG. 9, ***there is no indication that the comparison of properties of a data structure results in any configuration data with respect to routers***, nor is there any store operation illustrated in Ciscon's FIG. 9 or described in its accompanying detailed description in columns 18 and 19.

Id. (all emphases by the Commission) (citing Appx1565-66). Notably, the Commission added emphasis to the portions about data, but overlooked the key intervening sentence that explains "the novelty here" relates to the limitation's recitation that configuration commands are stored in the database, as discussed above.

The public has a right to rely on all of Cisco's statements during prosecution, however, and the Commission erred by crediting only the ones it thought really mattered. *Fenner*, 778 F.3d at 1325 ("[T]he interested public has the right to rely on the inventor's statements made during prosecution, without attempting to decipher whether the examiner relied on them, or how much weight they were given."); *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) ("[A] patentee's statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation."); *Springs Window Fashions LP v. Novo Indus., L.P.*, 323 F.3d 989, 995 (Fed. Cir. 2003) ("The public notice function of a patent and its prosecution history requires that a patentee be held to what he declares during the prosecution of his patent.”).[14]

The Commission was led astray by looking for “clear and unmistakable disclaimer” and then not finding one. *See* Appx513. As a threshold matter, the Commission should not have required disclaimer in the first place because the claim language at best leaves open the question of whether the phrase “before being stored in said database” modifies the recited data or commands. Where a limitation is ambiguous, prosecution history is valuable evidence of what the limitation means, without resort to disclaimer, especially when the limitation was added by amendment. *See In re Papst Licensing Digital Camera Patent Litig.*, 778 F.3d 1255, 1261 (Fed. Cir. 2015) (“[T]he specification particularly, but also the prosecution history, informs the determination of claim meaning in context, including by resolving ambiguities[.]” (internal quotation and citation omitted)); *Board of Regents*, 533 F.3d at 1369.[15] Here, the prosecution history, discussed

[14] A contrary rule would encourage patent prosecutors always to make multiple arguments to distinguish references, thus ensuring their clients were never bound by any of them.

[15] *See also Indacon*, 824 F.3d at 1357; *Shire Dev.*, 787 F.3d at 1366-67; *Fenner*, 778 F.3d at 1325 (noting that “the prosecution history bolsters the district court’s construction” without first finding disclaimer). Prosecution history disclaimer applies, in contrast, where “the meaning is plain on the face of the claim language,” but the patentee, “by acting with sufficient clarity, disclaim[s] such a plain meaning or prescribe[s] a special definition.” *In re Papst Licensing*, 778 F.3d at 1261 (internal quotation and citation omitted).

above, unambiguously shows that the limitation Cisco added by amendment requires storing both commands and router configuration data in the database.

Even if the doctrine of prosecution disclaimer applies, the Commission erred in finding no clear and unmistakable disclaimer. Cisco's prosecution statements, both on their face and in the context of the continuing prosecution, were unmistakable—the Examiner would not allow the claims with storage of data recited or with the relevant limitation added and the storage of data argued, but would allow them only with the limitation recited ***and*** the argument concerning the storage of data and the storage of commands. Cisco cannot take back its argument that Ciscon does not cover the newly added claim limitation precisely because it did not "disclose, teach or otherwise suggest executing configuration commands before storing them in a database." Appx1573. *See North Am. Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 1340, 1345-48 (Fed. Cir. 2005) (finding prosecution disclaimer based on patentee's amendment and arguments). Indeed, the public notice function of the claims would be eviscerated if the statements like those made here do not qualify as clear and unmistakable disclaimer. *See Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) ("As a basic principle of claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public's reliance on definitive statements made during prosecution.").

4. This Court Should Vacate the Commission's Infringement Finding

The Commission took no position on whether Arista's accused products infringe if the claims require storing commands supplied by a user, even though the ALJ had found infringement under this construction. Appx518. Because the Commission took no position, this Court must vacate the infringement finding and remand the case for the Commission to evaluate the issue under the proper construction. *Beloit Corp. v. Valmet Oy,* 742 F.2d 1421, 1423 (Fed. Cir. 1984); *see also Linear Tech. v. Int'l Trade Comm'n*, 566 F.3d 1049, 1068-69 (Fed. Cir. 2009) (vacating Commission decision and remanding "for further proceedings, consistent with . . . our modified claim construction"); *VastFame Camera, Ltd. v. Int'l Trade Comm'n*, 386 F.3d 1108, 1116 (Fed. Cir. 2004).

B. Although Not Adopted by the Commission and Therefore Not Subject To Review, the ALJ's ID Erroneously Found Infringement Under the Correct Construction

The evidence is undisputed that the accused products do not store commands supplied by a user in any database and the ALJ erred in holding otherwise.

1. The Data that Results from Executing Commands Is Stored in the Database, Not the Commands Themselves

The ALJ erred in finding that, even with a narrow construction of "storing commands supplied by a user," Arista's Sysdb centralized database "stores the parsed commands sent from the CLI agent to Sysdb before being sent to the agents." Appx667. The problem with that statement is that "parsed commands" are not the user-supplied commands themselves, as the claim construction requires. According to the Commission, "parsed commands" are data generated by the CLI agent in the process of executing (i.e., parsing) the user-supplied commands.[16]

The only "commands supplied by a user" are the strings of characters the user enters through the "command line interface" (CLI).[17] The CLI agent parses then processes the commands to make system state changes. *See* Appx6049, 6053-56 (Q9-10) (Arista witness Duda), 6060 (Q20) (same); *see also* Appx664. The CLI agent's parsing generates data that is placed in the Arista Sysdb; the commands are never stored there. Appx664 ("[P]arsed commands are then sent to Sysdb, where they are stored."); Appx5495, 5520 (Q102) (Cisco's witness Almeroth stating, "CLI agent executes the command and puts ***the output*** in Sysdb." (emphasis added)); Appx6056 (Q10-11) (Arista witness Duda). Therefore, the Arista products store the data that results from parsing the commands and do not store the commands themselves in Sysdb.

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[16] *See* Appx664 ("The evidence shows that the user of an Arista switch inputs a configuration command into the command-line interface, and the command is sent to the CLI agent, which executes the command in a process referred to as 'parsing.'"). Cisco's expert coined the term "parsed commands." *See* Appx10129:19-21 (Cisco expert Almeroth).

[17] *E.g.*, Appx5520 (Q102) (Cisco's expert Almeroth); *see* Appx6053-56 (Q9) (Arista's witness Duda), 6060 (Q20) (same).

The ALJ erroneously found infringement because he considered the "parsed commands"—data that results from executing the command—stored in Sysdb to be "configuration commands supplied by a user." Appx667. But that does not meet the claim requirement to store what is executed (rather than the results of the execution)—i.e., ***configuration commands*** supplied by a user and ***executed*** by a router configuration subsystem before ***being stored*** in said database. Therefore, Arista switches do not literally infringe.[18]

2. The Accused Products Do Not Satisfy the Executing Before Storing Aspect of the Limitation

Even if "parsed commands" are considered to be commands supplied by a user (erroneously we submit), the temporal requirement of "executing before storing" is still not satisfied. The ID appears to find that agents other than the CLI agent execute the user-supplied commands. *See* Appx664-65 ("[T]he agent then processes the 'executed' or 'parsed' command to make the desired change to the router configuration data."). Under this theory, Arista products still do not infringe because the claims require that the commands be executed before they are stored.

More specifically, the CLI agent parses the commands and sends the outputted data to Sysdb, which sends that data to other agents, which in turn process the new information and implement the changes.[19] For example, the STP agent would receive updated data from Sysdb (the alleged "parsed commands") and execute code to switch its operation (the alleged execution of the parsed commands under this alternative infringement theory). *See* Appx6056-58 (Q12) (Arista witness Duda).

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[18] Cisco did not assert infringement by equivalents. Nonetheless, the difference between commands and the data that results from executed commands is substantial. Take, for example, a command to double a certain stored value of 6. The result of executing that command would be 12, but that is not the same as a command of "double."

The problem comes from the ID's finding that agents other than the CLI execute user-supplied commands by carrying out the desired change (i.e., other agents process parsed commands), which occurs after storage, whereas the claims require execution to precede storage. Specifically, the claim language states that the "commands supplied by the user" are executed by a router configuration subsystem and then stored in said database: "***configuration commands*** supplied by a user and ***executed*** by a router configuration subsystem ***before being stored*** in said database." Appx902-90 at 15:34-37, 16:60-63, 18:35-39. In other words, the claimed commands must be executed first, and then stored in said database.

If the agents are considered to execute the parsed commands, then they do so ***after*** the parsed commands have been stored in the database. Indeed, Cisco's expert admitted this: "Since Sysdb sent those other agents 'commands,' ***Sysdb***

[19] Appx664-55 ("[T]he 'executed' or 'parsed' command . . . is sent from Sysdb to the managing agent."); Appx6053-58 (Q9-13) (Arista's witness Duda).

stored 'commands' before sending them" to the agents, which execute them. Appx5550-51 (Q162) (Cisco's expert Almeroth) (emphasis added). Accordingly, Arista does not infringe under this theory.

III. The Remedial Orders Exceed the Commission's Authority

By including in its remedial orders Components that it never found to infringe, the Commission exceeded its limited Section 337 authority to adjudicate "articles that . . . infringe."

A. Section 337's Unambiguous Language Does Not Allow the Commission To Issue Orders Covering "Components Thereof" That Have Never Been Found To Infringe (Directly or Indirectly)

The Commission "is a creature of statute, and must find authority for its actions in its enabling statute[,]" Section 337. *Kyocera Wireless Corp. v. Int'l Trade Comm'n*, 545 F.3d 1340, 1355 (Fed. Cir. 2008). When the Commission orders relief that Section 337 does not authorize, its orders should be vacated. *See id.* at 1358.

Congress in Section 337 authorized the Commission to "f[ind]" and then "deal[] with" the importation of "articles that . . . infringe"—nothing more.

> Subject to paragraph (2), the following are ***unlawful***, and ***when found*** by the Commission to exist shall be ***dealt with*** . . . . (B) The importation into the United States, the sale for importation, or the sale within the United States after importation . . . , of ***articles that—(i) infringe*** a valid and enforceable United States patent . . . .

19 U.S.C. § 1337(a)(1) (emphases added); *see also id.* § 1337(a)(2) (reciting parallel requirement of a domestic industry with respect to "articles protected by the patent"). It follows from that language that the Commission must make a threshold finding that an imported article "infringes," before it has authority to deal with its importation. By extension, Congress did not authorize the Commission to deal with the importation of articles not found to infringe.

Subsequent language in Section 337 addressing the Commission's remedial authority consistently links back to its authority over "articles . . . that infringe." That other language authorizes the Commission, once it finds the importation of "articles that . . . infringe," to address the importation by issuing an order to exclude from the country "the articles concerned," *id.* § 1337(e)(1), and an order to cease and desist from "the unfair methods or acts involved," *id.* § 1337(f)(1). By referring back to the conduct declared "unlawful" in the earlier jurisdictional provisions, the statute makes clear that the Commission's remedial authority is coextensive with its jurisdiction over "articles . . . that infringe," which authorizes the Commission's action in the first instance.[20]

[20] This court noted in *Suprema* that "the articles concerned" in Section 337(e)(1) cannot be the exact physical goods found to be "articles that . . . infringe" under Section 337(a)(1), because the goods found to infringe were necessarily imported into the U.S. in the past, whereas an exclusion order applies prospectively to goods that have not been imported. 796 F.3d at 1349. Nevertheless, an exclusion order under Section 337(e)(1) is designed to enjoin future importations of articles similar to those previously found to infringe. *Id.*

This Court has consistently recognized that the Commission's authority to exclude articles hinges upon a finding that those articles infringe. *See Suprema*, 796 F.3d at 1341 ("If a violation of the statute is found, the Commission issues an exclusion order that bars the importation of some or all of the infringing products . . . ."); *see also ClearCorrect Operating, LLC v. Int'l Trade Comm'n*, 819 F.3d 1334, 1336 (Fed. Cir. 2016) ("The fact that something might infringe a U.S. patent is separate from the question of whether it is an 'article.' Both of these separate statutory requirements must be met in order for the ITC to exercise jurisdiction.") (Prost, C.J., concurring).

Despite the limitations of the statute, the Commission purported to "deal with" the importation of Arista network switch Components, while finding it "need not reach" whether they infringe. Appx527. The Commission simply determined that its infringement finding for fully-assembled switches sufficed to make the Components subject to remedial orders. *Id.*; *see* Appx568; Appx573.

The phrase "articles that . . . infringe" is not ambiguous with respect to whether the articles need to infringe or not; it cannot be interpreted as authorizing the Commission to exercise jurisdiction over articles that do ***not*** infringe. Accordingly, the Commission is not entitled to *Chevron* deference, and its remedial orders here should be vacated. *See Chevron*, 467 U.S. at 842 ("If the intent of Congress is clear, that is the end of the matter[.]").

B. The Commission Wrongly Extended Its Authority To Regulate the Domestic Manufacture of Devices That Incorporate Noninfringing Imported Components

Nor is the Commission's interpretation of the statute—permitting it to regulate Arista's domestic manufacturing operations—reasonable. For domestic manufacturing, the only imported "articles" are hardware Components, which provide generic functionality such as providing a rigid structure for mounting the switch's electronic components (resistors, capacitors, integrated circuit chips, etc.) (bare PCBs), enclosing the network switch (metal chassis), cooling it (fan modules), and supplying it with power (power supplies). Appx6090 (Q7) (Arista's witness Metivier), 6106 (Q85) (same); Appx5982 (Q159) (Arista's expert Hollingsworth). Where none of those imported "articles" infringes, there is no statutory basis for the Commission to regulate that activity.

The Commission's assertion of authority goes well beyond *Suprema*. In *Suprema*, a divided majority of this Court, sitting *en banc*, held that a Section 337 violation can be premised on induced infringement. 796 F.3d at 1352-53. The respondent imported scanner hardware, which directly infringed when combined with software within the U.S. *Id.* at 1342-43. The imported scanner hardware itself was ostensibly implicated in the infringement because the claims at issue recited limitations such as "scanning one or more fingers" and "capturing data representing a corresponding fingerprint image[,]" which the hardware performed.

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See id. at 1341.[21] The court held that because the importation and supply of the scanner hardware induced infringement, it could be an "article that . . . infringes" under Section 337. *Id.* at 1349 ("Induced infringement is one kind of infringement, and when it is accomplished by supplying an article, the article supplied can be an 'article that infringes' if the other requirements of inducement are met.").[22] Thus, regulation of the imported article at issue in *Suprema* (scanner hardware) was premised on a finding that it induced patent infringement.

Here, the Commission has extended its jurisdiction far beyond *Suprema*, by attempting to regulate the importation of Components that were never held to infringe at all, directly, contributorily, or by inducement. Absent that finding, there is no authority under Section 337 for the Commission to address the importation of Components, or Arista's use of the Components within the United States for domestic manufacturing of network switches.[23]

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[21] *See* Joint Appendix at A212, *Suprema, Inc. v. Int'l Trade Comm'n*, No. 2012-1170 (Fed. Cir. Oct. 10, 2012) (stating in the Commission Opinion that "Suprema's accused scanners use optical systems, including a light source and a sensor, to obtain images of fingerprints, and a platen for capturing fingerprints."). Most of the underlying record setting forth the element-by-element infringement analysis applied at the Commission level was confidential. *See id.* at A123-32.

[22] *See also Suprema, Inc. v. Int'l Trade Comm'n*, 626 F. App'x 273, 278 (Fed. Cir. 2015) (unpublished panel decision on remand) (*Suprema II*).

[23] Nor does *DeLorme Publishing Co. v. International Trade Commission* hold that Section 337 gives the Commission authority to address the importation of component articles that do not infringe. 805 F.3d 1328 (Fed. Cir. 2015). *DeLorme* involved a Consent Order, in which the respondent expressly agreed not to import

C. The Commission's "Components Thereof" Practice Is an Unauthorized Restraint of Trade in Unpatented Articles and Improper Intrusion Into Domestic Patent Disputes

The Commission's interpretation of Section 337 is not reasonable because it extends the Commission's authority to purported infringement that is wholly domestic and involves no infringing importation. That expansive view of the Commission's jurisdiction is contrary to Section 337's purpose and legislative history. *See Suprema*, 796 F.3d at 1349 (examining as part of the *Chevron* step two analysis whether "the Commission's interpretation [is] consistent with the statutory text, policy, and legislative history of Section 337"); *Mayo Found. for Med. Educ. & Research v. United States*, 562 U.S. 44, 58-59 (2011) (noting that a statute's purpose is relevant to *Chevron* step two).

As this Court and its predecessor have consistently recognized, the Commission exists as a mechanism to enforce substantive patent law at the border, not to expand patent protection beyond that which is otherwise considered infringement. For example, in *In re Amtorg Trading Corporation*, this Court's predecessor rejected an argument that the Commission's authority to investigate "unfair acts" in the importation of articles authorized it to enjoin imports of

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the components at issue. *Id.* at 1330-31. This Court reviewed the Consent Order as a matter of contract law, and the Commission's authority to address "articles that . . . infringe" under Section 337 was therefore not at issue. *Id.* at 1331.

products made by a patented process. 75 F.2d 826, 829 (C.C.P.A. 1935), *superseded by* 19 U.S.C. § 1337(a).[24] Because the patent laws, at that time, were expressly limited to U.S. territories, the importation and sale of a product made abroad by a patented process did not constitute infringement. *Id.* at 831-32. The court held that the Commission's authority did not extend beyond the concept of patent infringement, finding no indication in the legislative history that "it was the purpose of the Congress in enacting section 337 of the Tariff Act . . . to broaden the field of substantive patent rights." *Id.* at 834.

Likewise, in *Amgen, Inc. v. International Trade Commission*, this Court rejected an argument that the Commission has jurisdiction to bar importations of a product manufactured abroad, using a patented product. 902 F.2d 1532 (Fed. Cir. 1990). The imported article itself was not patented (rEPO), but was made abroad using another product that was patented (recombinant DNA). *Id.* at 1533-34. Although both substantive patent law and Section 337 had been amended in the wake of *Amtorg* to cover products made abroad by patented ***processes***,[25] neither covered products made abroad using patented ***products***. *Id.* at 1538-40. Finding no "clearly expressed legislative intention" to extend the statute beyond its plain meaning, the court held there could be no violation of Section 337. *Id.* at 1539-40. *Amtorg* and *Amgen* thus stand for the proposition that the Commission's authority under Section 337 "cannot be used to circumvent express congressional limitations on the scope of substantive U.S. patent law." *TianRui Group Co. Ltd. v. Int'l Trade Comm'n*, 661 F.3d 1322, 1333 (Fed. Cir. 2011).

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[24] After *Amtorg*, Congress amended both the substantive patent law and corresponding trade statute to provide protection against products made overseas according to a patented process. *See* 35 U.S.C. § 271(g); 19 U.S.C. § 1337a (1940) (providing the Commission authority over "[t]he importation for use, sale, or exchange of a product made, produced, processed, or mined under or by means of a process covered by the claims of any unexpired United States letters patent"). A similar provision appears in the current authorizing statute at § 1337(a)(1)(B)(ii).

[25] *See* 35 U.S.C. § 271(g); 19 U.S.C. § 1337(a)(1)(B)(ii).

This case is no different. The language of the statute is clear, and nothing in the purpose or legislative history of Section 337 warrants extending the Commission's jurisdiction beyond the plain language of the statute and the substantive patent law it was designed to enforce. Indeed, when Congress inserted the phrase "articles that . . . infringe" into the statute as part of the 1988 amendment, the "'fundamental purpose' . . . was to 'strengthen the effectiveness of section 337' against the 'importation of articles which infringe U.S. intellectual property rights.'" *Suprema*, 796 F.3d at 1351 (quoting H.R. Rep. No. 100-40, pt. 1, at 155 (1987)). Extending the Commission's jurisdiction over articles that it has not found to infringe contravenes the very purpose of the statute, and the Commission's contrary interpretation is not reasonable.

In addition, the Commission's interpretation of Section 337 extends its reach well beyond its intended purpose as a forum for international trade disputes, and into the realm of domestic patent litigation. As Congress recognized when it enacted the modern version of Section 337, "[t]he purpose of the Commission is to adjudicate trade disputes between U.S. industries and those who seek to import goods from abroad."[26] The Commission is "fundamentally a trade forum, not an intellectual property forum," *John Mezzalingua Assocs., Inc. v. Int'l Trade Comm'n*, 660 F.3d 1322, 1328 (Fed. Cir. 2011), and is designed to supplement, not replace, the jurisdiction of federal courts.

Section 337 was intended to fill a perceived gap in the ability of district courts to enforce patent rights against infringing importations. By providing the Commission with *in rem* jurisdiction over imported articles, Section 337 was designed to provide patent holders with more effective relief where the infringer is a foreign entity that is either difficult to identify or not subject to personal jurisdiction in a U.S. court. *See Sealed Air Corp. v. Int'l Trade Comm'n*, 645 F.2d 976, 985 (C.C.P.A. 1981) (explaining that Section 337 was "intended to provide an adequate remedy for domestic industries against unfair methods of competition and unfair acts instigated by foreign concerns operating beyond the in personam jurisdiction of domestic courts"); *see also Omnibus Trade and Competitiveness Act of 1988*, Pub. L. No. 100-418, § 1341(a)(2), 102 Stat. 1107, 1212 (finding that existing protections had "not provided United States owners of intellectual property rights with adequate protection against foreign companies violating such rights"). In short, the Commission exists to regulate international trade and protect American industry, not to adjudicate domestic patent disputes.

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[26] H.R. Rep. No. 100-40, pt. 1, at 157 (1987); *see also* S. Rep. No. 100-71, at 129 (1987) (stating substantially the same purpose); *InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 707 F.3d 1295, 1304 (Fed. Cir. 2013) (recognizing Congressional intent that "section 337 protects American industries"); *see also Lannom Mfg. Co. v. Int'l Trade Comm'n*, 799 F.2d 1572, 1580 (Fed. Cir. 1986) ("The purpose of Section 337 from its inception was to provide relief to United States industry from unfair acts, including infringement of United States patents by goods manufactured abroad.").

The Commission's interpretation of Section 337 is at odds with its legislative history and purpose. The statute is designed to encourage domestic manufacturing, not to discourage it. Where a U.S. company (Arista) chooses to manufacture products in the U.S., for sale to U.S. customers, the only possible international trade is components that are sourced from abroad and used in the manufacturing process. If the imported "articles" do not infringe, the dispute is purely domestic and should be litigated in the federal courts, which are well-suited for the task,[27] and there is no need for the Commission's *in-rem* jurisdiction to protect American industry against foreign importers. Indeed, Section 337 will have served its purpose by encouraging a U.S. industry in the products at issue.

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[27] Indeed, the U.S. government as the Commission's representative at the Supreme Court has expressly recognized that the Commission has no role in adjudicating purely domestic patent disputes. *See* Br. for the Federal Resp. in Opp'n at *15 & *16 n.*, *Nokia Inc. v. Int'l Trade Comm'n*, No. 12-1352 (U.S. filed Sept. 9, 2013), 2013 WL 4822161 ("[T]he ITC's enforcement authority is subject to distinct limitations that do not apply in district court." For example, "[t]he court in an infringement suit has authority to enjoin the manufacture and sale of infringing articles even where that manufacture and sale occurs wholly within

The Commission's view, that it can bar the importation of "components thereof" that have not been found to infringe, is contrary to its statutory authority and purpose. Because almost every modern electronic product includes at least some imported components, a ruling to the to the contrary would empower the Commission to go well beyond its charter and to have nearly unchecked powers to regulate domestic commerce, so long as there is any connection whatsoever to an importation, no matter how attenuated to patent infringement.

* * *

Because the Commission exceeded its authority by issuing remedial orders that cover Components it never held to infringe, this Court should vacate the Commission's remedial orders and remand the matter to the Commission, with instructions that it must make a threshold finding of infringement as to any component "article" intended to be excluded or covered by its remedial orders.

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the United States. Under Section 1337, by contrast, the ITC is authorized only to address offenses involving the importation of infringing articles, not to restrict purely domestic conduct.").

IV. The Commission Opinion Also Shows a Misunderstanding of the Standards for Contributory and Induced Infringement That Requires Correction

On remand, the Commission would need to address whether the Components at issue infringe contributorily or by inducement, for any remedial order to encompass the Components, as there is no allegation they directly infringe. Under a proper indirect infringement analysis, the imported Components (such as bare PCBs, fans, power supplies, and metal chassis) which have nothing to do with the patented technology—and indeed, are not even recited in any '537 patent claim—cannot possibly support a finding of contributory or induced infringement.

The Commission's Opinion reflects a misapprehension of those legal doctrines. Thus, in the interest of efficiency and judicial economy, this Court should instruct the Commission as to the proper standards for proving contributory and induced infringement on remand. *See, e.g.*, *Regents of Univ. of Cal. v. Dakocytomation Cal., Inc.*, 517 F.3d 1364, 1379 (Fed. Cir. 2008) (reaching issue not essential to the appeal in the "interest of judicial efficiency, as the issue has been fully briefed and that term will likely be at issue on remand").

A. Contributory Infringement Requires the Accused Component To Be a "Material Part of the Invention" That the Claims Recite

The Commission's understanding of contributory infringement law is flawed. To prove contributory infringement, one must show that the accused component is a "material part of the invention," in addition to showing that it lacks "substantial noninfringing use." 35 U.S.C. § 271(c).[28] The "invention" of a patent is defined by its claims. *See Phillips*, 415 F.3d at 1312 ("[W]e look to the words of the claims themselves . . . to define the scope of the patented invention." (quotation and citation omitted)). Contributory infringement thus requires a showing that the accused component is a "material part" of the invention set forth in the claims.

The Commission's Opinion reflects a misunderstanding of what that requirement means. When addressing the issue of contributory infringement by fully-assembled network switches, the Commission failed to analyze whether the switches were a material, or significant, part of the invention set forth in the claims. Appx525-27. Instead, the Commission focused on solely the fact that the switches were "part" of the claims because they include generic hardware elements that are recited in the claims, such as a "router device," "processor," or "memory," and are thus required for infringement.

> The Commission finds that the Blank Switches are a material part of the invention. The Blank Switches, which are made of various components such as a processor, memory, CPU card, chassis, switch card, and fan modules are required for independent claims 10 and 19. Specifically, independent apparatus claims 10 and 19 call for "a plurality of router subsystems" and "a router device having a processor and memory" and could not be

[28] *See also Fujitsu Ltd. v. Netgear Inc.*, 620 F.3d 1321, 1331 (Fed. Cir. 2010) (analyzing "material part of the invention" as an independent requirement of Section 271(c)).

> infringed without the underlying hardware that executes Sysdb. In addition, the Blank Switches are a material part of asserted independent method claim 1. Claim 1, requires both hardware, including "a plurality of router subsystems" and "a router device having a processor and memory," and software to, inter alia, request and access "router data."

Appx526-27 (citing Appx902-20 ('537 patent) at 15:22-41). The Commission's analysis is legally erroneous because it fails to consider whether those recited generic hardware elements are actually a "material" part of the invention set forth in the claims. That is, over and above simply being included as "part" of the claims, are the accused components actually "material," or significant, in the overall context of the invention that merits patent protection?

Although that analysis is required by the plain language of the statute itself, the legislative history also provides helpful context. The "material part of the invention" requirement was added to Section 271(c) to prevent contributory infringement from becoming so expansive that it would reach components that "ha[ve] nothing to do with the invention." *Patent Law Codification and Revision: Hearing on H.R. 3760 Before the Subcomm. No. 3 of the H. Comm. on the Judiciary*, 82d Cong. 1st Sess. 157 (1951). In the words of the statute's author, Giles Rich, it means the component must be "part of the inventive contribution that the patentee made, something new that did not exist before that came from him." *Id.* at 154. The legislative history is thus fully consistent with the statutory language requiring an analysis of whether the accused component is a ***material*** part of the invention.

The Commission rejected Arista's argument that "material part of the invention" required it to analyze whether the hardware was material, or significant, to the invention set forth in the claims. The Commission held:

> Contrary to Arista's petition, there is no requirement that the component be directed to the "inventive contribution" of the patent in order to be a material part of the invention under section 271(c).

Appx526. That statement is imprecise, since Arista never argued that § 271(c) requires an accused component be "directed to" the inventive contribution of the patent. Arista argued, as Giles Rich had testified, that the accused component must be "part of" the inventive contribution—another way of thinking about whether it is a "material part" of the invention. Appx13023-24; Appx13405.

The Commission's understanding of Section 271(c) should be corrected for remand. Some of the Components (such as bare PCBs, fans, power supplies, and metal chassis) are not recited in the claims at all. Because they are not even "part" of the invention recited in the claims at all, they plainly are not a "material part" of the invention. Regardless, even if the Commission identifies a Component that is implicated as "part" of the claim language, the analysis does stop there. Section 271(c) requires the Commission to consider whether an accused component is actually a "material" part of the invention recited in the claims.

The Commission should be instructed that to exercise its authority to ban importation of an "article" based on contributory infringement, there must be a specific finding that the "article" contributes to infringement under the standard set forth in the statute and as explained in this Court's jurisprudence—i.e., that it be a "material part of the invention" recited in the claims.

B. Importations of Components Having No Connection to the Alleged Infringement Cannot Induce It

The Commission's Opinion also reflects a misapprehension of the law of induced infringement. Although inducement is a viable theory of infringement in Section 337 investigations, *see Suprema*, 796 F.3d at 1348, that theory applies only where the importation at issue actually induces infringement.

In *Suprema*, this Court held that the imported scanner hardware could be an "article that . . . infringes" under Section 337 even though it did not directly infringe at the time of importation, based on a theory that the scanner hardware was used to induce infringement after importation. *Id.* at 1340-41, 1348. But, the scanner hardware was actually connected to the infringement at issue, so that its importation could be viewed as part of the inducement. *See* n.21, *supra*; *Suprema*, 796 F.3d at 1348 (finding "articles that . . . infringe" in Section 337 is "susceptible to being read as satisfied by the indirect infringer's own acts, including importation that is part of inducement . . ."). The asserted patent claim was directed to use of the scanner hardware, reciting steps for "scanning one or more fingers," "capturing data representing a corresponding fingerprint image," and subsequent steps for processing the fingerprint image. *Id.* at 1341.

Here, the Commission applied a much broader theory of inducement than this Court endorsed in *Suprema*, such that importing even components that have nothing to do with the alleged infringement are viewed as inducing acts. The error is found in a separate part of the Commission Opinion addressing asserted patents concerning private virtual LAN technology (which are not directly at issue in this appeal). In that analysis, the Commission found that unspecified "components" induce infringement simply because they eventually become part of switch hardware (when assembled with other components in the U.S.) that is used to run EOS. Appx551 (finding that "components" induce because they are "designed to run" and used "exclusively" with EOS).

The Commission's analysis stretches the law of induced infringement too far. The claimed inventions were directed to private virtual LAN technology, and the alleged direct infringement related to a specific software feature within EOS for providing that functionality. The Commission made no finding whatsoever that any "component" (generic hardware such as bare PCBs, fans, power supplies, and metal chassis) was actually connected to the private virtual LAN inventions recited in the claims. Unlike in *Suprema*, the importation and supply of components that have nothing to do with the technology that is covered by the patent claims cannot be considered part of ***actively*** inducing the patents' infringement. *Suprema*, 796 F.3d at 1349 (finding the Commission has "authority to prevent importation of articles that have been part of inducement").

Fundamentally, an act must actually encourage, or promote, an infringement to constitute active inducement. *See, e.g.*, *Astornet Techs. Inc. v. BAE Sys., Inc.*, 802 F.3d 1271, 1279 (Fed. Cir. 2015) (noting that the alleged inducement must be an "affirmative act to encourage infringement" (quotation omitted)). Not every commercial act carried out in the course of an accused infringer's business is an act of inducement. For example, Arista would be free to sell specialized screwdrivers and other tools for use in servicing Arista switches, or run advertisements stating that Arista switches are "The New Standard in Software Driven Cloud Networking," without inducing infringement because such activities have no meaningful causal connection to the encouragement (inducement) of conduct that actually infringes the asserted claims. As another point of reference, the same would be true for a power company supplying electricity to a direct infringer. Though the electricity is ultimately used to carry out the infringement, the supply of electricity cannot be said to encourage the infringement because it has no connection whatsoever to the performance of the specific conduct that constitutes infringement.

Section 271(b) provides that only conduct which "actively induces infringement of a patent"—meaning, conduct which actively induces the performance of the claimed invention in a specific patent claim—constitutes induced infringement. 35 U.S.C. § 271(b); *see also, e.g.*, *Warner-Lambert Co. v. Apotex Corp.*, 316 F.3d 1348, 1363 (Fed. Cir. 2003) (stating requirement that the plaintiff must prove that "the defendants' actions induced infringing acts" and that through those actions, "the accused infringer knowingly aided and abetted another's direct infringement" (quotations omitted)). The statute contemplates that distribution or sale of certain products (or other commercial activities) that are simply too attenuated from the patented technologies at issue will fall outside of its reach because they do not ***actively*** induce any infringement of a patent claim.

Here, there are a whole host of importations—including Components such as bare PCBs, fans, power supplies, and metal chassis—that have no connection to the alleged infringement; they are not even elements recited by the asserted claims. Contrary to the Commission's expansive view of induced infringement, *Suprema* does not hold that any importation whatsoever that precedes direct infringement in the U.S., regardless of how attenuated, constitutes a Section 337 violation. This Court should instruct the Commission that, to issue a remedial order based on induced infringement, it must make specific findings that the "articles" involved actually, and actively, induce infringement.

CONCLUSION

Arista respectfully requests that this Court reverse the Commission's claim construction, vacate the finding of infringement, and vacate the remedial orders insofar as they cover Components, and remand the case.

Dated: September 23, 2016

Respectfully submitted,

/s/ Lauren A. Degnan

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ADDENDUM

Date	Description	Appendix No.
06/23/2016	Notice of the Commission's Final Determination Finding a Violation; Issuance of a Limited Exclusion Order and Cease and Desist Order; Termination of the Investigation	Appx501-504
07/26/2016	PUBLIC Commission Opinion	Appx566.001-566.061
06/23/2016	Limited Exclusion Order	Appx567-571
06/23/2016	Cease and Desist Order	Appx572-580
03/02/2016	PUBLIC Final Initial Determination	Appx888.001-888.306
01/21/2015	Notice of Institution of Investigation	Appx889-901
01/09/2007	U.S. Patent 7,162,537 – JX-0001	Appx902-920

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I)**	**Investigation No. 337-TA-944**

NOTICE OF THE COMMISSION'S FINAL DETERMINATION FINDING A VIOLATION; ISSUANCE OF A LIMITED EXCLUSION ORDER AND CEASE AND DESIST ORDER; TERMINATION OF THE INVESTIGATION

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has found a violation of section 337 in this investigation and has (1) issued a limited exclusion order prohibiting importation of certain network devices, related software and components thereof, and (2) issued a cease and desist order. The Commission terminates the investigation.

FOR FURTHER INFORMATION CONTACT: Amanda Pitcher Fisherow, Esq., Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2737. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2000. General information concerning the Commission may also be obtained by accessing its Internet server at *http://www.usitc.gov*. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov*. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION: The Commission instituted this investigation on January 27, 2015, based on a complaint filed on behalf of Cisco Systems, Inc. ("Complainant") of San Jose, California. 80 *Fed. Reg.* 4314-15 (Jan. 27, 2015). The complaint was filed on December 19, 2014 and a supplement was filed on January 8, 2015. The complaint alleges violations of section 337 based upon the importation into the United States, the sale for importation, and the sale within the United States after importation of certain network devices, related software and components thereof by reason of infringement of certain claims of U.S. Patent No. 7,162,537 ("the '537 patent"); U.S. Patent No. 8,356,296 ("the '296 patent"); U.S. Patent No. 7,290,164 ("the '164 patent"); U.S. Patent No. 7,340,597 ("the '597 patent"); U.S. Patent No. 6,741,592 ("the '592 patent"); and U.S. Patent No. 7,200,145 ("the '145 patent"), and alleges that an industry in the United States exists as required by subsection (a)(2) of section 337. The '296 patent was previously terminated from the investigation. The complaint named Arista Networks, Inc. ("Arista") of Santa Clara, California as the respondent. A Commission investigative attorney ("IA") is participating in the investigation.

On February 2, 2016, the ALJ issued his final ID finding a violation of section 337. The ID found a violation with respect to the '537, '592 and '145 patents. The ID found no violation based on the '597 and '164 patents. On February 11, 2016, the ALJ issued his Recommended Determination on Remedy and Bonding.

On February 17, 2016, Cisco and Arista filed petitions for review. On March 3, 2016, the parties, including the IA, filed responses to the respective petitions for review. On April 11, 2016, the Commission determined to review the ID in-part. The Commission determined to review the final ID on the following issues: (1) infringement of the '537, '597, '592 and '145 patents; (2) patentability of the '597, '592, and '145 inventions under 35 U.S.C. §101; (3) the construction of "said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database" of claims 1, 10, and 19 of the '537 patent; (4) the construction of "a change to a configuration" / "a change in configuration" of claims 1, 39, and 71 of the '597 patent; (5) equitable estoppel; (6) laches; (7) the technical prong of domestic industry for the '537, '597, '592 and '145 patents; (8) economic prong of domestic industry; and (9) importation. To the extent any findings that the Commission reviewed implicated the ID's findings for the '164 patent (*e.g.*, intent to induce infringement), the Commission also reviewed those findings for the '164 patent. The parties briefed the issues on review, remedy, bonding, and the public interest.

After considering the final ID, written submissions, and the record in this investigation, the Commission has determined to affirm-in-part the final ID and to terminate the investigation with a finding of violation of section 337. Specifically, the Commission finds that a violation of section 337 has occurred for the '537, '592, and '145 patents and no violation has occurred for the '597 and '164 patents. The Commission finds that the asserted claims of the '597 and '164 patents are not directly infringed by the accused products.

Having found a violation of section 337 in this investigation, the Commission has determined that the appropriate form of relief is (1) a limited exclusion order prohibiting the unlicensed entry of certain network devices, related software and components thereof thereof that infringe one or more of claims 1, 2, 8-11, and 17-19 of the '537 patent; claims 6, 7, 20, and 21 of the '592 patent; and claims 5, 7, 45, and 46 of the '145 patent; and (2) a cease and desist order prohibiting Arista from importing, selling, marketing, advertising, distributing, transferring (except for exportation), and soliciting United States, agents or distributors for States certain network devices, related software and components thereof that infringe one or more of claims 1, 2, 8-11, and 17-19 of the '537 patent; claims 6, 7, 20, and 21 of the '592 patent; and claims 5, 7, 45, and 46 of the '145 patent.

The Commission has also determined that the public interest factors enumerated in section 337(d) and (f) (19 U.S.C. §§ 1337(d) and (f)) do not preclude issuance of the limited exclusion order or a cease and desist order. Finally, the Commission has determined that a bond during the period of Presidential review (19 U.S.C. § 1337(j)) shall be in the amount of zero percent (0%) of the entered value of the imported articles that are subject to the limited exclusion order or cease and desist order. The Commission's orders and opinion were delivered to the President and to the United States Trade Representative on the day of their issuance.

The authority for the Commission's determination is contained in section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337), and in Part 210 of the Commission's Rules of Practice and Procedure (19 C.F.R. Part 210).

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued: June 23, 2016

CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I) **Inv. No. 337-TA-944**

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **NOTICE** has been served by hand upon the Commission Investigative Attorney, Andrew Beverina, Esq., and the following parties as indicated, on **June 23, 2016**.

Lisa R. Barton, Secretary
U.S. International Trade Commission
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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I)**	**Investigation No. 337-TA-944**

COMMISSION OPINION

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I. INTRODUCTION

On February 2, 2016, the presiding administrative law judge ("ALJ") issued his final initial determination ("ID") in this investigation, finding a violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("section 337"). Specifically, the ID finds a violation with respect to U.S. Patent Nos. 7,162,537 ("the '537 patent"), 6,741,592 ("the '592 patent"); and 7,200,145 ("the '145 patent"). The ID finds no violation with respect to U.S. Patent Nos. 7,290,164 ("the '164 patent"); and 7,340,597 ("the '597 patent"). On April 11, 2016, the Commission determined to review the ID in-part. Upon review, the Commission finds a violation of section 337 for the '537, '592, and '145[1] patents and no violation for the '597 and '164 patents. The Commission adopts the ID's findings that are consistent with this opinion.[2]

II. PROCEDURAL HISTORY

The Commission instituted this investigation on January 27, 2015, based on a complaint filed on behalf of Cisco Systems, Inc. ("Cisco") of San Jose, California. 80 *Fed. Reg.* 4314-15 (Jan. 27, 2015). The complaint alleges violations of section 337 based upon the importation into the United States, the sale for importation, and the sale within the United States after importation of certain network devices, related software and components thereof by reason of infringement of certain claims of the '537 patent; the '164 patent; the '597 patent; the '592 patent; the '145

[1] The Commission refers to the '592 and '145 patents as the "PVLAN patents." A "VLAN" is a virtual Local Area Network and a "PVLAN" is a private VLAN.

[2] The Commission notes that testimonial evidence, upon which the ID relies, accurately reflects the testimony of the expert and fact witnesses at the hearing. However, it appears that the transcript citations used in the ID are not always the same page number in the final transcript appearing on EDIS. Therefore, the Commission cites will include an additional 5 pages before and after each hearing transcript cite in the ID to ensure the testimony relied on by the ID, and to the extent adopted by the Commission is encompassed by the citation.

patent; and U.S. Patent No. 8,356,296 ("the '296 patent"), and alleges that an industry in the United States exists as required by subsection (a)(2) of section 337. The complaint named Arista Networks, Inc. ("Arista") of Santa Clara, California as the respondent. A Commission investigative attorney ("IA") is participating in the investigation.

On August 20, 2015, Cisco filed an unopposed motion to terminate the investigation with respect to the '296 patent, and various claims of the '597 patent, the '592 patent and the '145 patent. On August 21, 2015, the ALJ granted the motion. The Commission determined not to review this ID.[3]

On February 2, 2016, the ALJ issued his final ID finding a violation of section 337. The ID found a violation with respect to the '537, '592 and '145 patents. The ID found no violation with respect to the '597 and '164 patents. On February 11, 2016, the ALJ issued his Recommended Determination on Remedy and Bonding ("RD").

On February 17, 2016, Cisco, and Arista filed petitions for review of the ID.[4] Cisco did not petition for review of the ID's finding of no violation with respect to the' 164 patent. On March 3, 2016, the parties, including the IA, filed responses to the opposing petitions for review.[5]

---

[3] Notice of the Commission's Determination Not to Review an Initial Determination Terminating the Investigation As to Certain Claims. (Sept. 9, 2015).

[4] Complaint Cisco Systems, Inc.'s Petition for Review ("Cisco Pet."); and Respondent Arista Networks, Inc.'s Petition for Review of Initial Determination on Violation of Section 337 ("Arista Pet.").

[5] Complaint Cisco Systems, Inc.'s Response to Respondent Arista Network, Inc.'s Petition for Review ("Cisco Pet. Reply"); Respondent's Response in Opposition to Complainant's Petition for Review-In-Part of the Final Initial Determination ("Arista Pet. Reply"); and Combined

PUBLIC VERSION

On April 11, 2016, the Commission determined to review the ID in-part. Specifically, the Commission determined to review the following issues: (1) infringement of the '537, '597, '592 and '145 patents; (2) patentability of the claimed subject matter in the '597, '592, and '145 patents under 35 U.S.C. §101; (3) the construction of the limitation "said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database" in claims 1, 10, and 19 of the '537 patent; (4) the construction of the limitation "a change to a configuration" / "a change in configuration" in claims 1, 39, and 71 of the '597 patent; (5) equitable estoppel; (6) laches; (7) the technical prong of domestic industry for the '537, '597, '592 and '145 patents; (8) the economic prong of domestic industry; and (9) importation. The Commission also reviewed any findings for the '164 patent affected by the other issues under review. The Commission requested briefing on the issues under review and for briefing on remedy, bonding, and the public interest. 81 *Fed. Reg.* 22312-14 (April 15, 2016). On April 25, 2016,[6] and May 2, 2016,[7] the parties filed briefs in response to the Commission's notice. Cisco

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Response of the Office of Unfair Import Investigations to Complainant Cisco Systems, Inc.'s and Arista Networks, Inc.'s Petitions for Review of Final Initial Determination ("IA Pet. Reply").

[6] Complaint Cisco Systems, Inc.'s Written Submission In Response to the Commission's Determination To Review In-Part A Final Initial Determination of a Violation of Section 337 ("Cisco Br."); Respondent's Arista Networks, Inc.'s Response To Request For Writing Submissions Regarding the Issues Under Review ("Arista Br."); and Office of Unfair Import Investigations' Responses to the Commission's April 11, 2016 Questions ("IA Br.").

[7] Respondent Arista Networks, Inc.'s Response To Request For Writing Submissions Regarding the Issues Under Review ("Arista Reply Br."); and Office of Unfair Import Investigations' Reply to the Responses of the Private Parties to the Commission's April 11, 2016 Questions ("IA Br.").

filed a corrected brief on May 10, 2016.[8] Arista also submitted numerous letters regarding public interest on behalf of various third parties.

III. JURISDICTION AND IMPORTATION

The ID notes that the Commission has *in rem* jurisdiction over infringing articles imported, sold for importation, or sold within the United States after importation by the owner, importer, or consignee. ID at 3-4. The ID asserts that the importation of a single article could satisfy the importation requirement. *Id.*

Arista argued before the ALJ that a violation cannot be found because of [[

]][9][[

]] *Id.* at 4. The ID, however, finds that the accused devices were imported into the United States [[

]]. *Id.* Therefore, the ID concluded there was *in rem* jurisdiction over the accused devices.

The ID further notes that the "Commission has *in rem* jurisdiction over 'articles that . . . infringe' a United States patent, a set that includes components used in, or are otherwise a part of, contributory and induced infringement." *Id.* at 4-5 (citing *Suprema, Inc. v. Int'l Trade Comm'n*, 796 F.3d 1338, 1346 (Fed. Cir. 2015) (*en banc*) ("*Suprema II*") ("'[I]nfringement' is a term that encompasses both direct and indirect infringement, including infringement by importation that induces direct infringement of a method claim.). The ID concludes that the

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[8] Complaint Cisco Systems, Inc.'s Corrected Reply Brief In Response to Written Submission By Respondent and Staff on the Issues Under Review ("Cisco Reply Br.").

[9] Extensible Operating System ("EOS").

Commission thereby has jurisdiction over articles that contribute to or induce infringement, even when direct infringement occurs after importation. *Id.* at 5.

The ID considers the evidence and determines that in addition to [[

]]. *Id.* The ID determines that "the Commission has *in rem* jurisdiction over the switch hardware, inasmuch as they constitute 'articles that . . . infringe' pursuant to section 337 and the Federal Circuit's *en banc* decision in *Suprema* [*II*]." *Id.*

Arista petitioned for review of the ID's finding that [[

]]. *See, e.g.,* Arista Pet. at 29-31. The Commission determined not to review the ID's findings on jurisdiction, but to review the ID's findings on importation. No party challenges the ID's finding that [[

]]. *See* ID at 3-4. The Commission affirms this finding. The Commission also affirms the ID's findings that [[

]]. *Id.* at 5. The Commission does not need to reach [[

]] and therefore, takes no position on this issue. *See, e.g., id.* at 87.

IV. THE '537 PATENT

A. Overview

The '537 patent is entitled "Method and System for Externally Managing Router Configuration Data in Conjunction with a Centralized Database" and issued on January 9, 2007. Cisco asserts independent claims 1, 10, and 19, and dependent claims 2, 8, 9, 11, 17, and 18. *See id.* at 11.

B. Accused Products

The accused '537 products are Arista's 7010, 7048, 7050, 7050X, 7150, 7250X, 7280E, 7300, 7300X, and 7500E series switches. ID at 14. These switches run Arista's EOS. *Id.* At the center of EOS is "Sysdb"[10] is a centralized database that Cisco argues contains the complete state of the system and interfaces with various subsystems called "agents." *Id.*

C. Construction of the Claim Limitation: "said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database" (claims 1, 10, and 19)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	IA's Proposed Construction
The plain language requires that router configuration data be "stored in said database"	The plain language requires that configuration commands be "stored in said database"	None provided

ID at 64.

The ID notes that both Arista and Cisco address this term in their post-hearing briefs, but did not identify it as a term that needs construction. ID at 64. In analyzing whether these limitations are met for each of the asserted independent claims, however, the ID resolves the claim construction dispute. *See, e.g.,* ID at 72-74. The parties dispute centers on what is stored in the database. Arista argues that the user supplied configuration commands are stored while Cisco asserts that the router configuration data are stored. The ID finds that this limitation requires storage of router configuration data, not commands. *Id.* at 74. Arista petitioned for review of the ID's construction of this term. The Commission determined to review this issue.

---

[10] The Sysdb is a centralized database for [[ ]]. The parties use differing capitalization for this term, but the various capitalizations all reference the same thing.

The ID does not provide a discussion or analysis for its conclusion and construction and simply states that the intrinsic evidence does not support Arista's construction. *See* ID at 74, 64. The Commission finds, consistent with the ID, that the proper construction of this term requires the storage of router configuration data.

The specification supports this reading of the claim limitation. Specifically, the specification states that the focus of the '537 patent is on the storage of configuration data. JX-0001 ('537 patent) at 3:64–4:5 ("sysDB . . . provides a centralized storage and retrieval facility for router configuration *information*. . . . The configuration *information* stored on the sysDB may include, for example, Internet Protocol (IP) addresses. . . . user and password *data* . . . and other router *data* as known in the art.") (emphasis added); 7:30–32; 7:65–8:3; 8:7–9; 8:50–52. The specification further explains that the commands are executed and it is the router configuration information, which is stored:

> The config subsystem **28** carries out configuration commands for a user of the router, ***executing the configuration command*** received from the user and providing configuration information to the user of the router upon request from the user, among other things. As described above, this ***router configuration information is stored*** and managed by the sysDB 26 in the sysDB tree 42.

JX-0001 at 8:46–52. Moreover, the purpose of the invention is to manage router configuration data. JX-0001 at Title, Abstract, 3:13–15, 6:26–28.

Further, the prosecution history, considered as a whole, supports the ID's construction. The portions of the prosecution history relating to the Ciscon reference upon which Arista relies do not constitute clear and unmistakable disclaimer. *See e.g., Hockerson-Halberstadt, Inc. v. Avia Group Int'l, Inc.*, 222 F.3d 951, 956-57 (Fed.Cir.2000). Although the applicant stated "Ciscon fails to disclose . . . executing configuration commands before storing them in a database," it is clear that the applicant was not distinguishing Ciscon on the basis of commands being stored in the database. JX-0007 at CSI-AN 1-00098149.000506. In the subsequent paragraphs in the office action response, the applicant elaborated on its argument and confirmed that (1) there are no commands in Ciscon; and (2) it is the router configuration data, not the commands, that are stored. *Id.* at CSI-AN 1-00098149.000506-07; *see also* CX-0007C at Q/A 156. The applicant argued in it its response to the Office Action:

> Specifically, Ciscon discloses at column 18, lines 7–11 and 24–27 the description of FIG. 9, a flow diagram of the sequence for comparing properties of an object. . . . ***Applicant submits that structures here are not commands, and can in no way be construed to be equivalent to router configuration commands.***

JX-0007 at CSI-AN 1-00098149.000506-07; *see also id.* at CSI-AN 1-00098149.000507 ("[A]ll that is being performed [in Ciscon] is a comparison of fields with the composite structure, as specifically described in column 18, lines 21–24. This is not equivalent to executing a command that configures a router.") The applicant then asserted that Ciscon also fails to disclose the execution of user-supplied configuration commands resulting in configuration data that is stored in a database:

> Finally, there is no disclosure, teaching, or suggestion in Ciscon that ***execution of user-supplied configuration commands results in configuration data that is stored in a database***. As the present invention performs this claim limitation to manage router configuration data in conjunction with a centralized database, the novelty here is that this claim limitation provides a way to incorporate a database into managing user-supplied configuration commands, not properties of data structures, to more effectively configure routers deployed in a network. Directing Examiner's attention to the whole of FIG. 9, ***there is no indication that the comparison of properties of a data structure results in any configuration data with respect to routers***, nor is there any store operation illustrated in Ciscon's FIG. 9 or described in its accompanying detailed description in columns 18 and 19.

Id. at CSI-AN 1-00098149.000507-08 (emphasis added). Therefore, based on the intrinsic record, the Commission finds that the claims require storing of router configuration data, not user-supplied commands. The Commission further finds that Arista did not waive this argument.

D. Direct Infringement

The Commission determined to review the ID's findings of infringement. While the ID finds that all of the limitations of the asserted claims are met (ID at 64-82), Arista only challenged the ID's direct infringement findings with respect to a few claim limitations. The Commission affirms the ID's findings for the claim limitations not discussed herein. Arista also challenges whether a violation can be found because [[ ]]. Arista Pet. at 29-31. As discussed below, the Commission finds that direct infringement has occurred [[ ]] and such infringement supports a finding of indirect infringement by Arista. The basis of the Commission's finding of violation for the '537 patents is indirect infringement based on the direct infringement by Arista's [[ ]] products [[ ]]. The Commission does not reach whether Arista is liable for directly infringing the asserted claims.

1. "externally managing router data" (claims 1 and 10) / "externally manage router data" (claim 19) / "external management" (claims 1 and 10) / "management of" (claim 19) limitations

The ID finds that Arista's products satisfy this claim limitation when the agents in the EOS perform external management by [[ ]].[11] ID at 66 (claim 19). The ID explains that when the EOS agent [[ ]] data in Sysdb, [[ ]]. *Id.* The ID finds that the evidence confirms that the agents in EOS externally manage data. *Id.* at

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[11] Dr. Almeroth testified: [[ ]] CX-0007C at Q/A 88.

67-69. The ID further holds that [[ ]] is "pertinent to management." *Id.* at 70. The ID referred back to its findings for claim 19 in analyzing independent claims 1 and 10. *See* ID at 75, 76, 77, 90, 95. Arista petitioned for review of these findings.

The Commission finds that the accused products meet this limitation. Cisco alleges that agents in EOS perform external management by [[ ]] data in Sysdb. When an agent [[ ]] data in Sysdb, [[ ]]. *See, e.g.,* Tr. 999 ("[[ ]]."); JX-0026C 192 ("[[ ]]."). In addition, Sysdb cannot [[ ]]. CX-0007C at Q/A 91, 100, 130, 134; Tr. 999; JX-0026C at 194-195.

The record evidence further confirms Cisco's position that the EOS agents externally manage data. An Arista internal presentation given by Hugh Holbrook, Arista's VP of software engineering and [[ ]], states that [[ ]]. CX-0459C at ANI-ITC-944 945-1732776; *see also id.* at ANI-ITC-944 945-1732767. The presentation slides contain examples of [[ ]] that the agents manage, including [[ ]]. *Id.*; Tr. 192–193. Dr. Hollingsworth, Arista's expert, admitted that this presentation describes an agent in EOS that manages [[ ]]. Tr. 1002-03; JX-0001 at 3:67–4:5.

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Additional documents also evidence that the agents manage various things in EOS. CX-1098C at 2:24-3:16, 32:5-8, 45:1-4. In addition, testimony from Dr. Hollingsworth confirmed that Arista's EOS agents externally manage [[ ]] by [[ ]] and that [[ ]] are router configuration data. Tr. 1003-04.

The fact that an agent will [[ ]] does not negate the evidence cited above proving this limitation is met. Dr. Hollingsworth admitted that the mere fact that [[ ]] says *nothing* about whether there is external management. Tr. at 1014.

Arista argues that because the accused products [[ ]], the products do not infringe. *See* Arista Pet. at 27. However, SysDB 26, described in the '537 patent [[ ]] performs verifications which are unrelated to external management. *See, e.g.*, CX-0007C at Q/A 136; Tr. 198, 201–201; JX-0001 at Fig. 8. For example, in Figure 8 of the patent, the verifications shown are independent from whether or not there is external management. JX-0001, Fig. 8, 14:6-43; CX-0007C at Q/A 136.

Arista is wrong in asserting that the ID does not link the [[ ]] with activities that are "external management. The ID states that "[s]pecifically, agents in EOS perform external management [[ ]] and that "[w]hen an EOS agent [[ ]] data in Sysdb, [[ ]] and provides supporting evidence. ID at 66. The ID also states that "[a]dditional evidence establishes that [[ ]] is pertinent to management" and cites more evidence. ID at 69 (citing CX-1098C (Transcript of Holbrook [[ ]] Presentation) at 42 ("[[ ]]."), 45 ("[[

]]."); CX-0035C at 7; JX-0034C at 98).

The Commission affirms the ID's finding that this limitation is met and adopts the ID's findings consistent with this opinion.

2. "said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database" (claims 1, 10, and 19) limitations

The ID finds that the accused products store router configuration data as required by the claims. ID at 71-74 (claim 19). However, if the claims are construed to require the storage of user commands, the ID also finds that the accused products store user commands. ID at 74.

Arista petitioned for review of the ID's findings. The Commission determined to review the ID's claim construction of this term and therefore, also reviewed the ID's findings of infringement. The ID found that Arista products infringed under Cisco's construction, and in the alternative, under Arista's own construction. Arista's petition for review was premised on the Commission adopting its construction of this term. *See, e.g.,* Arista Pet. at 14. Therefore, the Commission adopts the ID's findings on this limitation. However, the Commission takes no position on the ID's alternative finding that Arista also infringes when [[ ]]. ID at 74.

E. Indirect Infringement

1. Specific Intent and Knowledge

(a) Importation Practices

The ID finds that Arista changed its importation practices shortly after Cisco filed the complaint in this investigation. ID at 83. The ID finds the change was [[

]] *Id.* The ID explains that [[

]] *Id.* The ID concludes that [[

]] led to the conclusion that Arista had a specific intent to induce infringement through the importation of the accused products. *Id.* Arista petitioned for review the ID's findings, and the Commission determined to review them.

On review, the Commission affirms the ID's finding that Arista's [[

]] evinces knowledge and an intent to infringe under the relevant standards for contributory and induced infringement. Arista argues that the Commission should apply the Federal Rule of Evidence ("FRE") 407.[12] We agree with Arista and the IA that Arista's arguments for applying FRE 407 is not waived and note that Cisco first identified this issue in its pre-hearing brief. Thereafter, Arista raised the issue in opposition to a motion in *limine* and raised the issue in its post-hearing brief. Arista raised this issue at its earliest opportunity in response to the issue which was raised by Cisco in its pre-hearing submission.

The Commission is not bound to apply the FRE and as such need not apply them here. Instead, the Commission is bound by the Administrative Procedures Act, 5 U.S.C. § 500-596 ("APA"), and can consider all relevant evidence. *See, e.g.,* 5 U.S.C. §556. Moreover, whether

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[12] FRE 407 states:

> When measures are taken that would have made an earlier injury or harm less likely to occur, evidence of the subsequent measures is not admissible to prove:
>
> - negligence;
> - culpable conduct;
> - a defect in a product or its design; or
> - a need for a warning or instruction.

But the court may admit this evidence for another purpose, such as impeachment or — if disputed — proving ownership, control, or the feasibility of precautionary measures.

FRE 407 is applicable to patent cases appears to be an unsettled question. *See, e.g., Kowalski v. Anova Food, LLC*, No. CIV. 11-00795HG-RLP, 2015 WL 1119411, at *3 (D. Haw. Feb. 18, 2015); *Mikkelsen Graphic Eng'g Inc. v. Zund Am., Inc.*, No. 07–C–0391, 2011 WL 1330782, at *11 (E.D. Wis. Apr. 7, 2011), *vacated in part on other grounds*, 541 Fed. Appx. 964 (Fed. Cir. 2013). Accordingly, the Commission declines to apply FRE 407 [[ ]].

At the time of the filing of the complaint in this investigation, Arista imported its switches [[ ]]. Starting in January 2015, Arista changed its importation practice [[ ]]. CX-1009C; Tr. at 1156-58. Arista's witnesses did not testify [[ ]]. *See e.g.,* Tr. at 1157-58. This change in importation practice did not [[ ]] and adopts the ID's findings consistent with this opinion.

"The requisite intent to induce infringement may be inferred from all of the circumstances." *Water Techs. Corp. v. Calco, Ltd.*, 850 F.2d 660, 669 (Fed. Cir. 1988). And "[t]he drawing of inferences, particularly in respect of an intent-implicating question ... is peculiarly within the province of the fact finder that observed the witnesses." *Broadcom Corp. v. Qualcomm Inc.*, 543 F.3d 683, 700 (Fed. Cir. 2008) (quoting *Rolls-Royce Ltd. v. GTE Valeron Corp.*, 800 F.2d 1101, 1110 (Fed. Cir. 1986)). The ID found that the change in importation practice [[ ]]. ID at 83. The evidence establishes that [[

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]], as the ID found, [[ ]]. *See, e.g.,* RX-3914C at Q/A 63, 66, 69. The Commission finds that [[

]].

Accordingly, the Commission finds that Cisco established Arista's specific intent to infringe.

Arista also argues before the Commission that the evidence does not rise to the level of showing intent because it relied on a good faith basis for non-infringement. The Ground Rules governing this investigation includes Ground Rule 7 addressing the contents of the "Prehearing Brief and Statement." The rule states, in relevant part, that "[a]ny contentions not set forth in detail as required therein shall be deemed abandoned or withdrawn, except for contentions of which a party is not aware and could not be aware in the exercise of reasonable diligence at the time of the prehearing statement." Order No. 2 (Ground Rules) at G.R. 7. In the section of its pre-hearing brief entitled "The Accused Products Do Not Indirectly Infringe the Asserted Claims," Arista did not argue that it had a good-faith basis to believe that it did not infringe the asserted patent; but argued instead that "the evidence is insufficient to show that any of Arista's alleged conduct was done with 'knowledge that the induced acts constitute patent infringement.'" Arista Pre-Hearing Br. at 165-66. Arista also stated that it has "explained that there are numerous reasons it does not infringe the asserted claims." *Id.* at 166. This single sentence does not set forth in detail Arista's claimed contention concerning a good faith belief in non-infringement and the Commission finds that this single sentence is not sufficient to preserve Arista's argument. Therefore, the Commission concludes that Arista's good faith belief argument was waived before the ALJ and Arista cannot now rely on a good faith belief to negate the evidence of an intent and knowledge to induce or contribute to infringement of the '537 patent.

(b) Willful Blindness

The ID finds that Arista intentionally and willfully blinded itself to the knowledge of Cisco's patents. ID at 83-84. The ID determines that there was evidence of Arista's subjective belief that it was infringing Cisco's patents, such as [[

]]. *Id.* The ID further finds that [[

]]. *Id.* at 85.

The ID concludes that, based on Arista's knowledge of the patent and its specific intent to infringe, Arista is liable for induced and contributory infringement if direct infringement is shown. *Id.* at 85-86.

Arista petitioned for review of the ID's findings, and the Commission determined to review them. As discussed herein, even if Arista was found not to have a specific intent to infringe, the Commission finds, at the very least, Arista intentionally and willfully blinded itself as to Cisco's patents, including the '537 patent and the PVLAN patents, prior to its knowledge of its alleged infringement.

Willful blindness is sufficient to meet both the knowledge and specific intent requirements for induced infringement. *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 769-771 (2011). A finding of willful blindness requires (1) the subjective belief that there is a high probability that a fact exists; and (2) the taking of deliberate steps to avoid learning of that fact. *Id.* at 769-70.

Mr. Duda, Mr. Holbrook, and Dr. Cheriton, Arista co-founders, were Cisco employees when Sysdb was under development at Cisco. Mr. Holbrook talked with engineers at Cisco during his employment about Sysdb and he learned about some of the features of Sysdb. JX-0027C at 70-71, 73-74, 96-97. Mr. Cheriton, Ms. Ullal, Arista's CEO, and Mr. Sadana, a senior vice president of customer engineering, all testified that that they knew Cisco had a large patent portfolio and Ms. Ullal, Mr. Sadana, Mr. Duda testified that [[ ]]. JX-22C at 104-05; JX-0042C at 178-179, 40-41; JX-33C at 221; Tr. at 787-88.

In addition to the knowledge of Sysdb and [[ ]]. For example, in an internal email related to [[ ]] (which are not at issue in this investigation), an Arista employee stated "[[ ]]." CX-0198C. Although Mr. Sadana testified that [[ ]]. JX-0033C at 228. In addition, Arista [[ ]]. CX-201C. Mr. Sadana further testified that [[ ]]. However, he asserted that [[ ]]. JX-0033C at 217. He admitted that [[ ]]. *Id.* at 221. Ms. Ullal, Arista's CEO, [[ ]]. CX-206C; JX-0042C at 218-19. [[ ]]. CX-210C. Arista consulted [[ ]]. CX-205C. In addition, Arista [[ ]]. CX-209C. Finally, Ms. Ullal testified that [[

]]. JX-0042C at 58.

While most, if not all, of the evidence relates to the [[ ]]. Based on the totality of the evidence in the record, the Commission finds that the evidence supports the ID's finding that Arista was willfully blind to the '537 patent, [[ ]].

The Commission also finds that Arista was willfully blind to the PLVAN patents, as discussed in more detail below. For example, an Arista internal design document, which is [[ ]] CX-0034C. Another internal Arista email communication notes Arista [[ ]]. CX-0052C. That email admits that Arista's "[[ ]]." *Id.* Indeed, Mr. Arneja testified that [[ ]]. *See, e.g.*, JX-0019C at 46 ([[ ]]). Based on this evidence and [[ ]], the Commission affirms the ID's finding that Arista was willfully blind to the PLVAN patents.

(c) Knowledge of the Patents

The ID found Arista had knowledge of the asserted patents such that the knowledge requirements for induced and contributory infringement were met. ID at 85-86. No party challenged the ID's findings on this issue and the Commission affirms these findings.

2. Contributory and Induced Infringement

Arista petitioned for review of the ID's findings on contributory and induced infringement and the Commission determined to review them.

(a) Contributory Infringement

(i) The ID

The ID finds that Arista is liable for contributory infringement and explains that "the components implicated in Arista's contributory infringement of the '537 patent are the Accused Products with EOS, which are a material part of the claimed invention with no substantial non-infringing uses." ID at 88. The ID finds that the fact that [[ ]] does not absolve Arista of liability because the hardware components are described in the claims and therefore are material parts of the invention that are necessary to perform the other aspects of the invention. *Id.* at 88-89.

The ID finds [[ ]] has no substantial non-infringing uses because [[ ]]. *Id.* at 89. The ID finds that [[ ]] contribute to infringement [[ ]]. *Id.*

Arista petitioned for review of the ID's findings. The Commission determined to review this issue.

(ii) Analysis

Under 35 U.S.C. § 271(c), a party is liable for infringement if he "offers to sell or sells within the United States or imports into the United States ... a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial non-infringing use." In addition, the complainant must show that the accused infringer knew that the component was patented and infringing and that the respondent's components have no substantial non-infringing uses. 35 U.S.C. § 271(c); *see* §IV.E.1. Arista does not challenge, in its petition for review, the ID's finding that there are no non-infringing uses of its switches,[13] but only challenges that the components are material. Arista Pet. at 39-42. Contrary to Arista's petition, there is no requirement that the component be directed to the "inventive contribution" of the patent in order to be a material part of the invention under section 271(c). *See Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1320 (Fed. Cir. 2009) (finding a component material with no novelty analysis). As the ID found, the fact that the accused products are imported [[ ]][14] does not necessarily negate liability. ID at 88. The various components of the imported accused products are claimed in the asserted apparatus claims, and asserted method claim 1 could not be carried out without the accused products.

The Commission finds that [[ ]] are a material part of the invention. The [[ ]] are required for independent claims 10 and 19.

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[13] Accordingly, the Commission finds that this argument was waived. However, for the reasons discussed below in §VI.B.2 for the PVLAN patents, the Commission finds that there are no substantial non-infringing uses [[ ]]. *See e.g.,* Tr. at 1162; CX-0007C Q/A 252-273. Any hypothetical non-infringing use is insufficient to support of finding of substantial non-infringing uses. *Vita-Mix Corp. v. Basic Holding, Inc.,* 581 F.3d 1317, 1327 (Fed. Cir. 2009).

[14] [[ ]] *See* Arista Br. at 4-5.

Specifically, independent apparatus claims 10 and 19 call for "a plurality of router subsystems" and "a router device having a processor and memory" and could not be infringed without [[ ]]. In addition, [[ ]] are a material part of asserted independent method claim 1. Claim 1, requires both hardware, including "a plurality of router subsystems" and "a router device having a processor and memory," and software to, *inter alia*, request and access "router data." JX-001 at 15:22-41.

Although Arista argues that each of the [[ ]] must also be material to the invention, the Commission need not reach this issue. [[ ]]. Accordingly, the Commission affirms the ID's finding that Cisco established contributory infringement by Arista.

(b) Induced Infringement

(i) The ID

The ID finds that Arista is liable for actively inducing third parties to infringe the '537 patent. ID at 87. Specifically, the ID finds that Arista knowingly induces infringement by encouraging, instructing, and enabling third parties to use the accused products in a manner that infringes the asserted claims. *Id.* According to the ID, Arista knows and intends that [[ ]], and that Arista encourages, aids, facilitates, and otherwise causes others to use EOS. *Id.* at 87-88. The ID finds that the evidence of active inducement includes presentations, documents, and manuals. *Id.* at 88. The ID further finds that

Arista's sales and promotion of switch hardware also induces infringement of the '537 patent because the hardware is designed to run the EOS software which contains Sysdb. *Id.*

Arista petitioned for review of these findings and the Commission determined to review them.

(ii) Analysis

35 U.S.C. § 271(b) provides: "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b). Induced infringement requires that an infringer, with knowledge of the patent and infringement, "actively induce[]" another to infringe the patent with specific intent to encourage infringement. 35 U.S.C. § 271(b); *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1928 (2015).

The Commission finds that Arista's sale and promotion of its accused products, [[ ]], constitute acts of induced infringement. As discussed above, the Commission finds that the intent and knowledge requirements are also met. *See* §IV.E.1. [[ ]]. JX-0026C at 204, 205 (*e.g.*, "[[ ]]"), 212–213; CX-0175; CX-41C at ANI-ITC-944_945-1619604; CX-335. [[ ]]. *E.g.*, Tr. at 1162; CX-0035C; JX-0026C at 204-07, 273–275; CX-0007C Q/A 252–273. Arista promotes the use of EOS through presentations, documents, and manuals, for example. *See e.g.,* CX-0273, CX-0256C at ANI-ITC-944_945-3933367; JX-0026C at 197, 330; CX-0214; CX-0075; CX-0286. Accordingly, the Commission finds induced infringement by Arista.

F. Laches

The ID notes that laches has not previously been available as a defense in 337 investigations, ID at 270,[15] but that after the hearing in this investigation the Federal Circuit, sitting *en banc*, issued its opinion in *SCA Hygiene Products v. First Quality Baby Prod.*, 807 F.3d 1311 (Fed. Cir. 2015) (*en banc*), which held that laches may be considered in injunctive relief cases. ID at 270-71 n. 45. The ID explains that *SCA Hygiene* limits the district courts' consideration of laches to bar injunctive relief in patent cases to the confines of *eBay v. MerchExchange, L.L.C.*, 547 U.S. 388 (2006) and the decision is silent as to whether laches is a defense in section 337 investigations. *Id.* The ID finds that Arista has not shown that departing from prior Commission precedent is warranted in this investigation. *Id.* at 270.

Nonetheless, the ID holds that Cisco did not delay in bringing suit for an "unreasonable and inexcusable" length of time. *Id.* at 271. The ID finds that Cisco did not become aware of Arista's infringement of Cisco's patents until May 2014 and therefore, the delay until filing on December 19, 2014 was not unreasonable. *Id.* The ID finds that the evidence relied upon by Arista fails to show that Cisco should have known of Arista's infringement earlier. *Id.* at 271-72. The ID further finds that Arista failed to prove that it was prejudiced by any delay. *Id.* at 272.

Arista petitioned for review of the ID's findings and the Commission determined to review them. Prior to *SCA Hygiene,* the Commission had determined that laches did not apply to the Commission based on *Aukerman.* Arista argues that the holding in *A.C. Aukerman Co. v.*

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[15] *See, e.g.*, *Certain Sortation Systems, Parts Thereof, and Products Containing Same*, Inv. No. 337-TA-460, Initial Determination, at 266, n.20 (Oct. 22, 2002) (the Commission does not recognize laches as a defense under section 337) (reviewed on other grounds); *Certain Personal Watercraft and Components Thereof*, Inv. No. 337-TA-452, Order No. 54 (Sept. 19, 2001) (precluding the affirmative defense of laches) (unreviewed).

R.L. Chaides Const. Co, 960 F.2d 1020 (Fed. Cir. 1992) (*en banc*) that laches could not bar prospective relief was rejected by the Court in *SCA Hygiene*. Arista Br. at 66; *see also SCA Hygiene*, 807 F.3d at 1332. After the Commission asked the parties to brief whether laches is an available defense at the Commission, the Supreme Court granted *certiorari* to address the question of whether laches is available as a defense in patent infringement actions. The Commission declines to reach the legal issue of whether laches is available as a defense at the Commission given the uncertainty of the law and finds that regardless of whether laches is available as a defense at the Commission, Arista's evidence does not satisfy its burden to prove laches for the '537 patent.

In order to find laches, Arista must prove that Cisco delayed in bringing suit for an unreasonable and inexcusable length of time from when Cisco knew or reasonably should have known of Arista's infringement and that the delay caused material prejudice to Arista. *Aukerman*, 960 F.2d at 1028 (overruled on other grounds). Under *Aukerman*, a delay of six years causes a presumption of laches to arise. If the presumption applies, the burden shifts to Cisco to dispute the reasonableness of the delay. *Id.* at 1027.

The issue of whether Arista has proven laches on the merits requires an examination of the facts and law. Arista argues that Cisco had a duty to investigate whether Arista's products were infringing. The Federal Circuit has held, in *Wanlass v. General Elec. Co.*, 148 F.3d 1334, 1338 (1998), that:

> Although laches will not bar a patentee whose ignorance is justifiable, ignorance will not insulate him from constructive knowledge of infringement in appropriate circumstances. *See Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 988 F.2d 1157, 1162, 26 U.S.P.Q.2d 1038, 1042 (Fed.Cir.1993) ("Absent actual knowledge, the facts must support a duty of inquiry."); *see also Wetzel v. Minnesota Ry. Transfer Co.*, 169 U.S. 237, 241, 18 S.Ct. 307, 42 L.Ed. 730 (1898) ("The interests of public order and tranquillity demand that parties shall

> acquaint themselves with their rights within a reasonable time, and, although this time may be extended by their actual ignorance, or want of means, it is by no means illimitable."); *Potash Co. of Am. v. International Minerals & Chem. Corp.*, 213 F.2d 153, 155, 101 U.S.P.Q. 264, 265 (10th Cir.1954) (In patent cases, like others, "[l]aches will not be imputed to one who has been justifiably ignorant of facts which create his right or cause of action. But ignorance will not of itself excuse delay. The party must be diligent and make such inquiry and investigation as the circumstances reasonably suggest, and the means of knowledge are generally equivalent to actual knowledge.") (citations omitted).
>
> These circumstances include "pervasive, open, and notorious activities" that a reasonable patentee would suspect were infringing. *See Hall v. Aqua Queen Mfg., Inc.,* 93 F.3d 1548, 1553, 39 U.S.P.Q.2d 1925, 1928 (Fed.Cir.1996). For example, sales, marketing, publication, or public use of a product similar to or embodying technology similar to the patented invention, or published descriptions of the defendant's potentially infringing activities, give rise to a duty to investigate whether there is infringement. *See id.* (constructive knowledge where defendant sold and marketed allegedly infringing products through print advertisements and trade shows); *Pearson v. Central Ill. Light Co.,* 210 F.2d 352, 356, 100 U.S.P.Q. 285, 288 (7th Cir.1954) (constructive knowledge where defendant published a product brochure, which it distributed to the trade); *A.R. Mosler & Co. v. Lurie,* 209 F. 364, 371 (2d Cir.1913) (barring infringement suit "[w]here owners have remained ... supine for many years, shutting their eyes to what was going on in the art to which the patent belonged"). *See generally* Jean F. Rydstrom, Annotation, *Laches as defense in patent infringement suit,* 35 A.L.R. Fed. 551, 577–79 (1977) (examining cases in which constructive knowledge was imputed to the patentee).

Various district courts have stated the following standard:

> If a patentee knows of the existence of a product or device that (i) embodies technology similar to that for which he holds a patent and (ii) uses that similar technology to accomplish a similar objective, he has a duty to examine the product or device more closely to ascertain whether it infringes his patent. If he shirks this duty, he does so on peril of triggering the laches period and perhaps ultimately losing his right to recover damages for the infringement.

I/P Engine, 915 F. Supp. 2d 736, 741-42 (E.D. Va. 2012) (quoting *Odetics, Inc. v. Storage Tech. Corp.,* 919 F.Supp. 911, 918 (E.D.Va.1996), *on remand,* 14 F.Supp.2d 800 (E.D.Va.1998), *aff'd in part, rev'd in part,* 185 F.3d 1259 (Fed.Cir.1999); *see also Crown Packaging Tech., Inc. v. Rexam Bev. Can Co.*, 679 F. Supp. 2d 512, 520 n.42 (quoting same); *St. Clair Intellectual*

Property Consultants, Inc. v. Acer, Inc., 2013 WL 3367319, at *3 (D.Del. Jul.2, 2013); *see also Wanlass v. Fedders Corp.*, 145 F.3d 1461, 1466-67 (Fed. Cir. 1998) ("*Fedders*").

Cisco admits that it knew of the 7124 and 7148 switches in the fall of 2008 and that they included Arista's Sysdb. RX-3879C at Q/A 32-33; RX-21C. Around that period, Cisco also performed a competitive analysis of these products. This competitive analysis was for sales purposes and included identifying how to distinguish Arista's products. *See, e.g.*, CX-1221C at Q/A 53-58; JX-0062C at 57, 152-53. This competitive analysis process was captured in various slide presentations. RX-3120C is one such presentation and it includes information regarding EOS software. In particular, this slide presentation describes EOS as having a modular operating system and Linux OS kernel that runs independently from system processes, but it does not mention Sysdb. *See* RX-3120C at CSI-ANI-00056464.000044-45. This presentation does not contain any detailed information on the operation of the software or provide any indication that there is also external management. There is no information in this presentation regarding infringement of Cisco's patents.

Arista also relies on several documents dated in 2009 that contain Arista confidential information to allege that Cisco should have known of Cisco's infringement. *See, e.g.*, RX-2964C and RX-4007C. Arista's position rests on Cisco possessing these documents in 2009. The documents were produced by Cisco in this investigation, but there is no evidence to show when or how Cisco came into possession of these documents. Moreover, these documents are dated fewer than six years before Cisco's filing of the ITC complaint in 2014 such that they do not create a presumption of laches. These documents are similar to RX-3120C in that they do not contain any information to suggest external management. While these documents do include a hub and spoke representation, showing a system managed through Sysdb, these documents do not provide any indication that there is external management of the agents and do not evince that Cisco knew or should have known of Arista's infringement. Arista has failed to show that Cisco knew of these documents or that these documents demonstrate that Cisco knew of Arista's infringement.

Similarly, the 2009 blog post, CX-0479, also does not demonstrate that Cisco knew or should have known that Arista was infringing the '537 patent. This blog post does not contain any information on Sysdb that would indicate external management and there is no evidence of when Cisco became aware of this document.

Arista argues that Cisco had a duty to investigate whether Arista's products infringed. As discussed above, courts have found that, in some circumstances a patentee has a duty of inquiry. Courts have held that when the "patentee knows of the existence of a product or device that (i) embodies technology similar to that for which he holds a patent and (ii) uses that similar technology to accomplish a similar objective, he has a duty to examine the product or device more closely to ascertain whether it infringes his patent." In *Johnston v. Standard Mining Co.,* 148 U.S. 360, 370 (1893), the Court held that a plaintiff is only chargeable "with such knowledge as he might have obtained upon inquiry, *provided the facts already known by him* were such to put upon a man of ordinary intelligence the duty of inquiry." The Federal Circuit has been reluctant to impose a duty of inquiry in cases where the infringement is "difficult to discern" or not apparent." *See Fedders,* 145 F.3d at 1467. In *Wanless,* the Federal Circuit imposed a duty to investigate where there was an open and notorious sale of easily testable products, the plaintiff offered a license, and the defendant indicated that it intended to continue using various infringing features. *Wanless,* 148 F.3d at 1139-40. Here, Arista's infringement is not open and notorious because it would take significant investigation to determine whether the accused products use external management of the '537 patent. *See generally* CX-7C (Almeroth WS) (containing over 200 questions and citing over 75 documents to show infringement.).

In addition, Cisco has an extensive patent portfolio of over 12,000 patents and requiring Cisco to perform infringement analyses for every feature that a sales team is aware of, is unreasonable. *See Fedders,* 145 F.3d at 1465. In addition to all of this evidence, Mr. Lang, Cisco's Vice President, Intellectual Property and Deputy General Counsel, testified that Cisco did not become aware of Arista's infringement of the '537 patent until July 2014 (five months before filing suit). CX-1221 at Q/A 59.

Therefore, for the above reasons, the Commission finds that there was no unreasonable delay in this case. The Commission does not reach the issue of material prejudice. The Commission adopts the ID's findings on this issue that are consistent with this opinion.

G. Technical Prong of the Domestic Industry Requirement

The ID finds that the domestic industry products asserted for the '537 patent, running Cisco's IOS XR operating system, practice 1, 2, 8, 10-11, 17 and 19. ID at 89-100. No party petitioned for review of these findings, but the Commission determined to review these findings because it determined to review a claim construction. On review, the Commission affirms the ID's findings.

V. THE '597 PATENT

A. Overview

The '597 patent is entitled "Method and Apparatus for Securing a Communications Device Using a Logging Module" and issued on March 4, 2008. Cisco asserts independent claims 1, 39, and 71, and dependent claims 14, 15, 29, 63, 64,[16] 72, and 73 of the '597 patent. ID at 17.

B. Accused Products

Cisco accuses Arista's 7010, 7048, 7050, 7050X, 7150, 7250X, 7280E, 7300, 7300X, and 7500E series network switches of infringing the '597 patent. ID at 19. Cisco asserts that these communication devices comprise a subsystem and a logging module named Process Manager ("ProcMgr"). *Id.*

C. Construction of the Claim Limitation: "a change to a configuration" (claim 1) / "a change in a configuration" (claims 39 and 71)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	The IA's Proposed Construction
No construction necessary. If construction is necessary, "a change to the state of the device"	a change to the settings of the subsystem specified by the user	No construction necessary. The IA's original proposed construction, if construction is necessary, was "a change to the state of the device." The IA's revised construction is "a change to the settings of the subsystem"

The parties dispute the meaning of "a change to a configuration" in the claim phrase of claim 1 "a logging module, coupled to said subsystem, and configured to detect *a change to a configuration* of said subsystem of said communications device." Similarly, the parties also dispute the meaning of "a change in a configuration of a subsystem" as recited in claim 39 and 71. The ID construes the terms "a change to a configuration" and "a change in configuration" in claims 1, 39, and 71 to mean "a change to the state of the device." ID at 112. The ID finds that Cisco's expert Dr. Wicker testified that the patent's detected configuration changes relate to

[16] Claims 63 and 64 depend from unasserted claim 40, which depends from asserted claim 39.

"'any compromise' of the device." *Id.* The ID explains that the patent describes the logging module detecting software modification, anomalous conditions, hardware resets, user interaction through the command line interface, and changes made by the device itself. *Id.* at 112-113. The ID finds that the specification uses "state" and "configuration" interchangeably such that "configuration" includes the state of the device. *Id.* at 113.

The ID further finds that the intrinsic record does not support the construction proposed by Arista. *Id.* Specifically, the ID explains that "settings" is not used in the specification, and the specification discloses embodiments where configuration changes are made by the network device, instead of the user. *Id.* at 113-14.

Arista petitioned for review the ID's construction. The Commission reviewed the construction and on review modifies the ID's construction of this term. The ID's construction, which adopted Cisco's proposed construction, renders the term "subsystem" ambiguous. Under the ID's construction, the claim limitation of claim 1 reads: "a logging module, coupled to said subsystem, and configured to detect **a change to the state of the device** *of said subsystem* of said communications device." Similarly, under the ID, the claim limitation of claims 39 and 71 read: "[detecting/detect] **a change to the state of the device** *of the subsystem*." The parties agree that the changes are made to the subsystem even if "of the device" is included in the construction. However, this construction on its face is ambiguous and confusing. The specification and prosecution history support a finding that the change is to the subsystem.

Arista's proposed construction recites "a change to the settings of the subsystem specified by the user." The term "settings" only appears in the specification for one embodiment. Arista asserts that the ID's construction is too broad in that it encompasses all types of changes while "setting" limits the types of actions within the scope of the patent. Arista relies on the file history to support its argument, but the file history appears instead to distinguish the Brown prior art on the basis that the logging module coupled to a subsystem are both encompassed in the communications device. *See* JX-0010 at CSI-ANI-00097276.000109-111. In its office action response, Cisco repeatedly describes the changes in "status" in Brown, but its focus is on distinguishing Brown based on the arrangement of elements, not whether the changes were to configuration versus a status. *Id.*

In discussing the scope of configuration changes that are encompassed within claims 1, 39, and 71, the ID includes a broad statement that "'configuration' encompasses all types of changes to different aspects of the device" which would extend the claims beyond the specification. ID at 113. However, the specification teaches that configuration changes embrace software modifications, anomalous conditions, hardware resets, user interaction through the command line interface, and changes made by the device itself, such as a device setting its own source IP and MAC address. JX-0004 at 1:30-33, 14:52-54, 4:35-38, 9:18-21, 5:33-36. The Commission therefore finds that the ID's statement is too broad and the changes should be limited to the types of configuration changes described in the '537 patent, not *all* changes to the subsystem as suggested in the ID's statement. Accordingly, consistent with the specification, the Commission construes the terms "a change to a configuration" and "a change in configuration" to mean "a change to the state" (*e.g.*, software modifications, anomalous conditions, hardware resets, user interaction through the command line interface, and changes made by the device itself, such as a device setting its own source IP and MAC address).

D. Direct Infringement

The ID found that the accused products do not infringe the asserted claims of the '597 patent. The ID analyzed the "a change to a configuration" (claim 1) / "a change in a configuration" (claims 39 and 71) / "determine the configuration" (claim 72) claim limitation of independent claims 1, 39, and 71 and dependent claim 72, found it was not met, and did not analyze any additional limitations of the claims or rule on indirect infringement. The Commission determined to review the ID's infringement findings. As discussed below, the Commission also finds that the asserted independent claims are not infringed based on these limitations and does not reach the other claim limitations.

1. The ID

(a) Claims 1, 39, and 71: "detect a change to a configuration of said subsystem"/ "detect/[ing] a change in a configuration of a subsystem" limitations

The ID determines that asserted claim 1 requires that the logging module "detect a change to a configuration of said subsystem" and claims 39 and 71 require "detect/[ing] a change in a configuration of a subsystem." ID at 118. The ID notes that these terms were construed to mean "a change to the state of the device." *Id.*

The ID explains that Cisco relies on three mechanisms within Arista's ProcMgr to satisfy the limitation of detecting a change in configuration including: [[

]]. The ID reproduces an illustration of these three mechanisms based on Dr. Wicker's testimony:

[[

]]

Id. at 118-119 (reproducing RDX-1001C (adding circled numerals)). The ID finds that none of these mechanisms detect a change in a configuration. *Id.* at 119. The ID explains that ProcMgr [[ ]]. *Id.* Specifically, the ID explains [[

]]. *Id.* Indeed, ProcMgr [[ ]]. *Id.* The ID finds that ProcMgr [[

]]. *Id.* [[ ]]. *Id.* In addition, [[ ]]. *Id.* The ID also finds that ProcMgr [[

]]. *Id.* at 119-120.

(i) [[ ]] Do Not "Detec[t] a Change in a Configuration"

The ID notes that Dr. Wicker testifed that the [[ ]] are related and together monitor agent failures. *Id.* at 120. The ID finds that each [[

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]]. *Id.* The ID finds that [[

]]. *Id.* [[

]]. *Id.*

The ID concludes that ProcMgr's [[

]] does not constitute detecting whether the [[ ]] configuration has changed as required by the claims. *Id.* The ID finds instead that ProcMgr [[

]]. *Id.*

(ii) [[ ]] Does Not Detect a Change to a Configuration of a Subsystem

The ID finds that ProcMgr does not satisfy the "detect a change to a configuration of said subsystem"/ "detect/[ing] a change in a configuration of a subsystem" limitations when it determines [[

]]. *Id.* at 120-21. The ID finds that the [[

]], as confirmed by Cisco's expert, Dr. Wicker. *Id.* at 121.

The ID finds that the evidence shows that the [[

]] and that [[

]]. *Id.* For example, the ID explains that [[

]] and that this [[

]] *Id.* Therefore, the ID concludes that [[

]]. *Id.*

(b) Claim 72

The ID finds that the accused products do not infringe claim 72 because ProcMgr does not determine the configuration of the identified subsystems (*i.e.*, agents). *Id.* at 121-122. The ID finds that [[ ]] and [[ ]]. *Id.* at 122. The ID finds that the [[ ]]. *Id.* Therefore, the ID concludes that these functionalities do not determine a change in configuration of the agent. *Id.*

2. Analysis

(a) Claims 1, 39, and 71: "detect a change to a configuration of said subsystem"/ "detect/[ing] a change in a configuration of a subsystem" limitations

(i) [[ ]]

In the Arista system, ProcMgr [[ ]]. [[ ]] has a [[ ]]. *See, e.g.,* RX-3912C at Q/A 43. If [[ ]]. *See, e.g.,* RX-3912C at Q/A 51. ProcMgr will then [[ ]]. However, ProcMgr [[ ]]. *See, e.g.,* RX-3912C at Q/A 43; CX-245C at ANI-ITC-944_945-015219. ProcMgr is [[ ]]. *See, e.g.,* RX-3912C at Q/A 49-51; CX-614C at ANI-ITC-944_945-0152198.

The patent describes the covered changes to a configuration to include software modifications, anomalous conditions, hardware resets, user interaction through the command line interface, and the changes made by the device itself, such as a device setting its own source IP and MAC address. JX-0004 at 1:30-33; 14:52-54; 4:35-38; 9:18-21; 5:33-36. The '597 patent describes an anomalous condition as one where there is a potential compromise of security. *See, e.g.* JX-0004 at 14:52-54, 14:59-63, 15:4-5. We find that ProcMgr's determination that [[ ]] does not constitute a change to a configuration of the subsystem as described in the '537 patent. Instead, ProcMgr is [[ ]]. *See, e.g.,* RX-3912C at Q/A 51.

(ii) [[ ]]

ProcMgr [[ ]]. Indeed, ProcMgr [[ ]]. For these reasons, at most ProcMgr, may [[ ]].

ProcMgr also [[ ]]. *See, e.g.,* CX-001C at Q/A 125, 143. These files contain information on [[ ]]. RX-3909C at Q/A 245; CX-1C at Q/A 128; *see also* Tr. at 1283-84; RX-3912C at Q/A 43. The files stored [[ ]] as Cisco contends. Cisco Pet. at 19. [[ ]]. Tr. at 1283-84.

The [[ ]]. This file includes [[ ]]. For example, it includes the [[ ]]. *See, e.g.,* CX-245C at ANI-ITC-944945-0150224.

[[ ]]. *Id.* at ANI-ITC-944945-0150221. The process includes: (1) determining [[ ]], (2) determining [[ ]], and (3) [[ ]]. *Id.* at ANI-ITC-944_945-0150222. Cisco asserts process step (2) is the [[ ]].

Cisco asserts that the ID does not address the second half of its [[ ]] argument and when the whole process is considered, there must be a finding of infringement. However, contrary to Cisco's assertion, in order to determine what [[ ]]. *Id.* If the [[ ]]. *Id.* [[ ]]. Accordingly, the Commission finds that these claim limitations are not met by the accused products. The Commission adopts the ID's findings consistent with this opinion.

(b) Claim 72

The ID's findings for claim 72 are closely related to its findings for claims 1, 39, and 71. For the same reasons discussed above, the Commission finds all of the elements of claim 72 are not met by the accused products. The Commission affirms ID's finding and adopts the ID's findings consistent with this opinion.

E. Indirect Infringement

The Commission does not reach any issues related to indirect infringement for the '597 patent. Because the claims are not directly infringed, there can also be no finding of indirect infringement.

F. Validity: Patentability Under 35 U.S.C. § 101[17]

The Commission determined not to review the ID's findings that assignor estoppel applies to Arista. 81 *Fed. Reg.* 22312-14 (April 15, 2016). This determination prevents Arista from making any challenges to the validity of the '597 patent, including § 101 challenges. Accordingly, the Commission need not reach this issue and takes no position on the ID's findings for this issue.

G. Technical Prong of Domestic Industry

The ID finds that domestic industry products asserted for the '597 patent practice claims 1, 14-15, 39, and 71-72. ID at 122-131. While the Commission modifies the ID's construction of "a change to a configuration" (claim 1) / "a change in a configuration" (claims 39 and 71), this change does not alter the ID's determination on the technical prong of the domestic industry requirement. The Commission affirms the ID's findings. ID at 122-131.

[17] Section 101 limits patent-eligible subject matter to "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. §101. The inquiry involves determining whether the claims "transform [an] abstract idea into a patent-eligible invention", and require an "inventive concept" or "additional features" to ensure the patent does not seek simply to monopolize the abstract idea." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l.*, 134 S. Ct. 2347, 2352-57 (2014).

VI. THE '592 AND '145 PATENTS (PVLAN)

A. Overview

1. The '592 Patent

The '592 patent is entitled "Private VLANs" and issued on May 25, 2004. Cisco asserts independent claims 6, 20, and 21, as well as dependent claim 7. ID at 23.

2. The '145 Patent

The '145 patent is entitled "Private VLANs" and issued on April 3, 2007. The '145 patent is a continuation of the '592 patent and the two patents share the same specification. Cisco asserts independent claims 5, 7, 45, and 46.

3. Accused Products

Cisco contends that Arista's 7010, 7050, 7050X, 7150, 7250X, 7300, and 7300X series network switches that run Arista's EOS software, which in turn supports the PVLAN feature, infringe the asserted claims of the PVLAN patents (the "Arista VLAN products"). ID at 27.

B. Infringement

1. Direct Infringement

The Commission determined to review the ID's findings of infringement. While the ID finds that all of the limitations of the asserted claims are met, Arista only challenged the ID's direct infringement findings based on its argument that the PVLAN patents are conceptual. Arista Pet. at 61-66. Arista also challenges the ID's findings because [[

]]. *Id.* at 67 n.41. As discussed below, the Commission finds that direct infringement has occurred by the fully assembled and operational products as used by Arista's customers and such infringement supports a finding of indirect infringement by Arista. The basis of the Commission's finding of violation for the PLVAN patents is indirect infringement based on the direct infringement [[

]]. The Commission does not reach whether Arista is liable for directly infringing the asserted claims.

(a) The ID

The ID finds that the Arista VLAN products infringe all of the asserted claims of the PVLAN patents. ID at 172. The ID finds that Cisco's expert, Dr. Jeffay, testified that the Arista VLAN products infringe and the testimony of Arista's fact witness Gagan Arneja and expert witness, Mr. Moisand, supports the infringement finding. *Id.* The ID analyzes each of the limitations of the asserted claims and finds that they are met by the Arista VLAN products. *Id.* at 173-95.

The ID notes that Arista's non-infringement position is based on its argument that VLANs abstract and therefore cannot process packets as required by the claims. *Id.* at 196. The ID finds that Arista's arguments that VLANs are an abstract concept are contradicted by Arista's pre-litigation documents and record evidence. *Id.* at 196-98. The ID explains that Arista's EOS User Manual specifically defines VLANs as "layer 2 structures" and refers to Arista's PVLANs as a "network structure." *Id.* (citing CX-0075 at 761, 762). The ID further finds that the "802.1Q-1998 standard itself defines a VLAN as '[a] subset of the active topology of a Bridged Local Area Network' where the 'active topology' is 'the set of communication paths formed by interconnecting the LANs and Bridges by the forwarding Ports.'" *Id.* (citing RX-0186 at 9, 30; CX-1220C at Q/A 19). The ID explains that the VLANs are specific structures enabled through the use of hardware and software. *Id.* at 196-197 (discussing the Arista User Manual and testimony from Mr. Moisand and Mr. Arneja).

The ID also rejects Arista's arguments that its VLANs are not one-way connections (ID at 198-199), its isolated ports do not prevent the exchange of packets (ID at 199), and that Cisco merely relies on a naming convention (ID at 199-200). The Commission determined to review the ID's findings.

(b) Analysis

The Commission finds that VLANs are not conceptual and adopts the ID's findings that are consistent with the discussion herein. The Commission finds that on balance that the evidence supports the ID's infringement determination.

Arista's first argument is that VLANs are a conceptual association that occur through the implementation of IEEE 802.1Q compliant tagging and therefore, do not process packets. Arista asserts that the ID ignored Cisco's expert testimony that shows the Arista VLAN products do not infringe. Arista Pet. at 62. Arista contends that in accepting Dr. Jeffay's assertion that the 802.1Q standard defines the virtual LAN as a subset or part of the LAN, Dr. Jeffay omitted a key portion of the definition. *Id.* Specifically, Arista argues that the standard defines "*an active topology* of a Bridged Local Area Network" and Dr. Jeffay admitted that the active topology does not transfer, receive, or reject packets. *Id.* Dr. Jeffay, Cisco's expert, testified that the definition of VLAN taken from the 802.1Q standard was fine but he also stated that there are "multiple views you can have [for a] LAN." Tr. at 493-495. However, Dr. Jeffay did not limit his definition to the 802.1Q standard or provide a restrictive definition of "active topology." *See, e.g.,* Tr. 493-95, 497; CX-1220 Q/A19-20. Dr. Jeffay testified that a VLAN is a segment of a physical LAN (*i.e.*, a LAN within a LAN). CX-0003C at Q/A 32. Inventor Edsall confirmed this definition. Tr. at 891. Dr. Jeffay also testified that the "active topology" as "acted on by the hardware" makes up the VLAN and is implemented such that it can receive, transfer and reject packets. Tr. at 497. Dr. Jeffay explicitly rejected Arista's argument that the VLANs are conceptual and explained that it is the hardware and the software together that makeup a VLAN. CX-1220 at Q/A 19.

Arista further asserts that the ID misinterprets Arista documents and testimony that support finding that [[ ]]. Arista Pet. at 63. However, Arista's witness testified during his deposition [[

]]. JX-0019C at 48; Tr. 1126-1128. It is understandable that documents describing the [[ ]] chip sets do not discuss VLANs because the documents describe only the hardware while VLAN are a combination of software and hardware. Additionally, the statements regarding [[ ]] does not change anything regarding the VLANs. Dr. Jeffay's testimony does not contradict his opinion that a VLAN is a structure that is realized in hardware and software. CX-1220C at Q/A 22–23.

Arista's EOS User Manual specifically defines VLANs as *"layer 2 structures"* and refers to Arista's PVLANs as a *"network structure."* CX-0075 at 761, 762. The manual further describes that "[i]solated VLAN ports *carry unidirectional traffic*" and that "[c]ommunity VLAN ports *carry traffic*." CX-0075 at 763. And Arista's [[

]]. CX-0031C at ANI-ITC-944_945-0772168-70. Arista points out that its witnesses stated that the Arista documents were describing [[ ]].

Last, Arista argues that the Cisco inventor testimony (Mr. Foschiano and Mr. Edsall) defining VLANs supports finding non-infringement. Arista Pet. at 65-66. Arista argues that

VLANs are conceptual because they are "numbers on a wire." Mr. Foschiano testified that VLANs are implemented using hardware components but he also explained that the "number on a wire" refers to a VLAN ID in a packet that identifies a specific structure, namely a VLAN, that the packet is associated with. JX-0051C 147-48. Inventor Edsall explained that saying a VLAN "may be carried in the packet" is the way that those skilled in the art refer to the fact that the VLAN ID is carried in the packet (*i.e.*, the packet has an identifier that associates it with a VLAN). Tr. 392. In addition, the VLAN patents teach using a VLAN Assignment number. *See, e.g.,* JX-0005 ('592) at 6:8–22. Therefore, the Commission finds that the VLANs are not abstract concepts, affirming the ID, and finds the asserted claims are directly infringed by the fully assembled accused products (including an operational version of EOS).

2. Indirect Infringement

The ID further finds that Arista is liable for induced infringement by encouraging, instructing, sell, promoting, and enabling third parties to use the Arista VLAN products that infringe the asserted patents. ID at 201. The ID also determines that Arista is liable for contributory infringement. *Id.* at 202-03. The ID finds that all of the claims require the imported switch hardware, including all of the components thereof. The ID finds that these were material components. *Id.* at 202. The ID further determines that the switch hardware has no substantial non-infringing uses because [[

]]. *Id.* at 202-03.

The Commission determined to review the ID's findings. The Commission finds, as discussed above, that the intent and knowledge requirements for indirect infringement were met for the PVLAN patents. *See* §IV.E.1.

Arista challenges the ID's finding that [[ ]] have no substantial non-infringing uses. Arista Pet. at 67. Arista asserts that the ID's finding is based on the fact that [[ ]]. *Id.* Arista asserts that [[ ]]. *Id.* at 67-68. Arista also contends that [[ ]]. *Id.* at 68.

As the Commission discussed in *Certain Television Sets, Television Receivers, Television Tuners, and Components Thereof*, Inv. No. 337-TA-910, Comm'n Op. at 44 (USITC Oct. 30, 2015) ("*Certain Television Sets*"), the proper test for determining whether there are substantial non-infringing uses is set forth in *Ricoh Co. Ltd. v. Quanta Computer Inc.*, 550 F.3d 1325 (Fed. Cir. 2008). In that case, the Federal Circuit held that if a subcomponent (in that case, a microcontroller) contributes to infringement, the fact that the subcomponent is part of a larger component does not negate contributory liability solely on the ground that the larger component is capable of substantial non-infringing uses. *Id.* at 1337-38. Thus, in considering substantial non-infringing uses in this case, we focus on the components accused of contributory infringement, [[ ]]. *See e.g.*, Tr. at 1162; CX-0075.

The "bundling" of non-infringing components with infringing components does not create substantial non-infringing uses. *See, e.g., Ricoh*, 550 F.3d at 1336–40 (*e.g.*, "While selling a potentially infringing product where each component part thereof has a substantial lawful use may well be 'equivocal' . . . , it is entirely appropriate to presume that one who sells a product containing a component that has no substantial noninfringing use in that product does so with the intent that the component will be used to infringe."). Further, turning off infringing features does not create substantial non-infringing uses. *Fujitsu Ltd. v. Netgear Inc.*, 620 F.3d 1321, 1331 (Fed. Cir. 2010) ("Netgear argues that because a user can turn off the infringing features, then there are substantial noninfringing uses . . . . [However,] [w]hether a user activates fragmentation [the infringing feature] is relevant to the extent of direct infringement, but does not establish substantial noninfringing uses."). Therefore, the Commission finds that [[ ]] have no substantial non-infringing uses and adopts the ID's findings that are consistent with this opinion.

With respect to induced infringement, Arista's sale and promotion of the Arista VLAN products [[ ]] are found to constitute acts of inducement [[ ]]. JX-0026C at 204, 205 (*e.g.*, "[[ ]]"), 212–213; CX-0175 at 731; CX-41C at ANI-ITC-944_945-1619604; CX-335. And [[ ]]. *E.g.*, Tr. at 1162; CX-0035C; JX-0026C at 204-07, 273–275; CX-0007C Q/A 252–273. Arista promotes the use of EOS through, for example, documents, manuals, and customer guidance. *See e.g.,* CX-0076, CX-0075 at CSI-ANI-00128383.000760-771, CX-0041C; CX-0043C, CX-0673. As discussed above in §IV.E.1, the knowledge and intent requirements for induced infringement have been met. Accordingly, the Commission finds that Arista has induced infringement of the asserted claims.

C. Validity: Patentability Under 35 U.S.C. § 101[18]

The ID notes Arista's argument that the claims of the PLVAN patents are directed to the idea of abstract VLANs and in particular the exchange or handling of packets by use of VLANs. ID at 234. The ID finds that the PVLAN patents are directed to a specific device (*i.e.*, a router or switch) configured in a specific way to have new types of ports and VLANs to isolate a user's traffic. *Id.* The ID finds that the physical devices are the opposite of an abstract idea. *Id.* The ID explains that the patent claims do not claim an algorithm or a computerized approach that was implemented manually in the prior art. *Id.* at 234-35.

The ID further finds that the patents cover an inventive concept. *Id.* at 235. The ID explains that the PVLAN patents solved problems in the prior art. *Id.* The ID determines that all of the asserted claims require special purpose devices, and do not require routine or conventional structures. *Id.* at 235-36.

Arista petitioned for review of the ID's findings on this issue and the Commission determined to review. On review, Arista's argument regarding unpatentability hinges on its position that VLANs are abstract. The Commission finds that VLANs are not abstract.

The Supreme Court laid out a two-part test for determining unpatentable subject matter in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l.*, 134 S. Ct. 2347 (2014). This test requires a determination as to (1) whether a patent's claims are directed to a patent-ineligible abstract idea, and if so, (2) whether its claims contain an inventive concept ensuring that the patent amounts to significantly more than a patent upon the abstract idea itself. *Alice*, 134 S. Ct. at 2355.

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[18] Arista does not make assignor estoppel arguments for the PVLAN patents.

As discussed above in detail with respect to direct infringement, the Commission finds that the claims are not directed to an abstract idea. The claims of the PVLAN patents are directed to a specific device, namely a switch or a router, configured to have new types of ports and new types of VLANs in order to isolate users' traffic. ID at 234; CX-1220C at Q/A 227. The claims all recite a switch or router comprising a VLAN—a definite structure. ID at 234; CX-1220C at Q/A 228. In addition, the claims are not directed to an algorithm, or merely computerize an approach that was implemented manually in the prior art, but to a device that solves a problem that existed in the networking field in the prior art. *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014) ("the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.").

Even if the claims are found to be directed to an abstract idea, they contain an inventive concept ensuring that the patent claims amount to significantly more than a patent upon the abstract idea itself. The claims are to a switch or router configured in a particular manner with VLAN type ports to create new types of functionality that did not previously exist. CX-1220C at Q/A 32–37. The PVLAN patents solved the problem in the prior art of separating users' traffic on a LAN by inventing a mechanism for isolating user traffic with specific configurations of new types of VLANs and new types of ports, that can be implemented and stored in assignment tables, memory, switching chips and other hardware or software components. CX-1220C at Q/A233–238. Therefore, the claims require a special purpose device with defined structures that transform the networking device into a special purpose machine. *See id.* at Q/A 238.

Accordingly, the Commission finds that the asserted claims are not invalid under § 101 and adopts the ID's findings consistent with this opinion.

D. Equitable Defenses

1. Equitable Estoppel

The Commission affirms the ID's determination that Arista did not meet its burden to establish that (1) Cisco, through misleading conduct, led Arista to reasonably believe that Cisco did not intend to enforce its patents against Arista; and (2) Arista relied on that conduct. ID at 263-267. The Commission does not reach or adopt the ID's findings on whether Arista was materially prejudiced.

2. Laches

The ID provides only a single laches discussion applicable to all of the asserted patents. We summarized the ID's findings above in discussing Arista's laches defense for the '537 patent. *See infra* § IV.F

The Commission finds that Arista has likewise not established laches for the PVLAN patents, regardless of whether or not laches is an available defense at the Commission. *See infra* § IV.F

Arista raised various issues regarding the PVLAN patents related RFC 5517 that were not addressed above for the '537 patent. *See* Arista Pet. at 81-83. Arista first offered its PVLAN functionality in 2012 and asserts that Cisco should have known that Arista infringed from this time. *Id.* Cisco filed the complaint in this investigation in December 2014. This delay of less than two years does not result in a presumption of laches. *Aukerman*, 960 F.2d at 1027. Arista relies on various cases that find laches after only three or four year delays where the parties were already litigating infringement or the infringement was "open and continuous." Arista Pet. at 81-

82. The facts of these cases are distinguishable because here Arista was not already in litigation with Cisco over these patents and infringement of these patents is not open and notorious. Arista cites no cases where laches was found where the delay was as short as two years. Arista also makes a strained argument with respect to Cisco's submission to the Internet Engineering Task Force ("IETF") of an Inter Partes Review disclosure ("IPR") from the U.S. Patent and Trademark Office, which linked the PVLAN patents to RFC 5517. *Id.* at 82; *see also* RX-3852. However, the IPR submission does not relate to infringement by Arista. In addition, contrary to Arista's assertion, the mere fact that other companies implement VLAN features does not mean that those companies infringe the PVLAN patents (and Arista has offered no proof that they do) or that because other companies implemented PVLAN that Cisco should have known that Arista infringed. Accordingly, the Commission finds that Arista has not met its burden in proving laches for the PVLAN patents.

E. Technical Prong of Domestic Industry

The Commission affirms the ID's findings that the domestic industry products asserted for the '592 and '145 patents practice the asserted domestic industry claims consistent with the constructions herein. *See* ID at 203-224.

VII. THE '164 PATENT

The ID finds that the '164 patent is not infringed and that the technical prong of the domestic industry was not met. ID at 250-255. Cisco did not petition for review of these findings. The Commission affirms these findings and takes no position on other issues related to the '164 patent (*e.g.*, laches).

VIII. ECONOMIC PRONG OF DOMESTIC INDUSTRY

No party petitioned for review the ID's determination on the economic prong of domestic industry but the Commission determined on its own motion to review the ID's findings on the economic prong of domestic industry. 19 C.F.R. § 210.44.

In order to establish a domestic industry, pursuant to section 337(a)(2) and (3), Cisco must establish "(A) significant investment in plant and equipment; (B) significant employment of labor or capital; or (C) substantial investment in [the patent's] exploitation, including engineering, research and development, or licensing." 19 U.S.C. § 1337(a)(2), (3). The Commission affirms the ID's finding that Cisco has established substantial investment in the exploitation of the patents under section 337(a)(3)(C) and takes no position on the other categories.

IX. REMEDY, BONDING AND PUBLIC INTEREST

Where a violation of section 337 has been found, the Commission must consider the issues of remedy, the public interest, and bonding. Section 337(d)(1) provides that "[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States ..." 19 U.S.C. § 1337 (d)(1).

A. Limited Exclusion Order ("LEO")

Cisco is seeking a limited exclusion order covering the accused products found in violation of section 337. Cisco Br. at 84-88. More specifically, the RD explains that Cisco seeks an LEO covering:

> Arista's imported network equipment, and also components and software therein, such as switches and their components, operating systems and/or

> other software, and "all products covered by the patent claims as to which a violation has been found," not just specific models accused of infringement.

RD at 3.

The RD recommends that the Commission issue an LEO covering products and components thereof that infringe the asserted claims. *Id.* at 5. The RD further recommends that the LEO include a standard certification provision. *Id.*

The Commission has "broad discretion in selecting the form, scope, and extent of the remedy." *Viscofan, S.A.* v. *U.S. Int'l Trade Comm'n,* 787 F.2d 544, 548 (Fed. Cir. 1986). The Commission may issue an exclusion order excluding the goods of the person(s) found in violation (a limited exclusion order) or, if certain criteria are met, against all infringing goods regardless of the source (a general exclusion order). As the ALJ recommended, the Commission finds that the appropriate remedy in this investigation is an LEO and a CDO. With respect to the LEO, the Commission includes both the standard[19] certification provision and an exemption for warranty and repair of existing products Arista has already sold to customers for which Arista is obligated to provide warranty, repair services, or software update services. With respect to the warranty/service provision, Cisco contends, if the Commission opts to include such a provision, that it should be limited to six-months from the time the LEO issues arguing that it will cover most of Arista's warranty/service obligations. Warranty and repair exemptions are common in Commission orders but they are usually not time limited. [[

[19] The standard provision does not allow an importer to simply certify that it is not violating the exclusion order as Arista suggests. CBP only accepts a certification that the goods have been previously determined by CBP or the Commission not to violate the exclusion order.

]]. Therefore, the Commission finds that a time limit is not appropriate.

The Commission declines to adopt Cisco's proposal that the Commission require Arista to seek modification of the Commission's orders or an advisory opinion for any redesign. The Commission has recently included such provisions in investigations, which involved spoliation of evidence. *Certain Opaque Polymers*, Inv. No. 337-TA-883, Comm'n Op. at 23-24 (Apr. 30, 2015); *Certain Stainless Steel Products, Certain Processes for Manufacturing or Relating to Same, and Certain Products Containing Same*, Inv. No. 337-TA-933, Comm'n Op. at 32 (June 9, 2016). No such circumstances exist here. Cisco has not provided sufficient reasons for the Commission to depart from CBP's and the Commission's normal practice.

B. Cease and Desist Order ("CDO")

Cisco seeks a cease and desist order directed against Arista. Cisco Br. at 89. The RD notes that the Commission generally issues a CDO with respect to the imported infringing products, when a respondent maintains a commercially significant inventory of the infringing products within the United States. RD at 5-6. The RD notes that Arista did not specifically address the appropriateness of a CDO in its post-hearing briefing. *Id.* at 7. The RD finds that the evidence demonstrates that Arista maintains a commercially significant inventory of the accused products. *Id.* Cisco presented evidence that Arista has maintained, on average, a total of [[ ]] units of inventory of its networking products at [[ ]] in [[ ]] between [[ ]]. *Id.* at 6. Therefore, the RD recommends that the Commission issue a CDO. *Id.* at 7.

Section 337(f)(1) provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order as a remedy for a violation of section

337. 19 U.S.C. § 1337(f)(1). Cease and desist orders are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order. *See, e.g., Certain Protective Cases and Components Thereof*, Inv. No. 337-TA-780, USITC Pub. No. 4405 (July 2013), Comm'n Op. at 28 (Nov. 19, 2012) (citing *Certain Laser Bar Code Scanners and Scan Engines, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-551, Comm'n Op. at 22 (June 14, 2007)); *Certain Agricultural Tractors, Lawn Tractors, Riding Lawnmowers, And Components Thereof* ("Agricultural Tractors"), Inv. No. 337-TA-486, USITC Pub. No. 3625, Comm'n Op. at 17 (August 14, 2003)). A complainant seeking a cease and desist order must demonstrate, based on the record, that this remedy is necessary to address the violation found in the investigation so as to not undercut the relief provided by the exclusion order. *Certain Integrated Repeaters, Switches, Transceivers, and Products Containing Same*, Inv. No. 337-TA-435, USITC Pub. No. 3547 (Oct. 2002), Comm'n Op. at 27 (Aug. 16, 2002) ("[C]omplainants bear the burden of proving that respondent has such an inventory. Because complainants failed to sustain their burden, we have determined not to issue a cease and desist order."); see also H.R. Rep. No. 100-40, at 160 (1987) ("When the Commission determines that both remedies [i.e., an exclusion order and cease and desist order] are necessary, it should be without legal question that the Commission has authority to order such relief.").

Arista does not present any arguments why a CDO should not issue. In this investigation, the record evidence demonstrates that there is a commercially significant U.S. inventory. CX-0010C at Q/A 238–242 (testifying to Arista's amount of inventory and concluding that it is commercially significant). Accordingly, the Commission determines that a CDO is appropriate.[20]

C. Bonding

Cisco is seeking imposition of a 100 percent bond. Cisco Br. at 89-91. The RD rejected Cisco's proposal for a 100 percent bond rate. RD at 11-12. In particular, the RD finds that Cisco failed to demonstrate that a price differential was not an appropriate method for calculating the bond, or that a reasonable royalty rate could not be calculated. *Id.* Therefore, the RD concludes that no bond should be required during the Presidential review period. *Id.* at 12.

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[20] Commissioner Schmidtlein supports issuance of the cease and desist order in this investigation. She agrees with the Commission that Arista's domestic inventory provides a basis for issuing the order. She, however, finds it unnecessary to confirm the existence of a "commercially significant" inventory because a commercially significant domestic inventory is not a statutory requirement. *See* 19 U.S.C. § 1337(f)(1). Indeed, the statutory language leaves it to the discretion of the Commission and does not establish any particular test or standard for issuing a cease and desist order aside from consideration of the public interest factors. *See Gamut Trading Co. v. Int'l Trade Comm'n*, 200 F.3d 775, 784 (Fed. Cir. 1999) (explaining that the Commission has broad discretion in selecting a remedy). From a practical standpoint, Commissioner Schmidtlein fails to see the value gained by requiring parties and the Commission to expend time and resources addressing the extent of domestic inventory levels as a predicate to issuing cease and desist orders. In her view, such a requirement unnecessarily carries risk for the complainant since even the presence of one infringing product in domestic inventory can undercut the exclusion order and prevent complete relief to the complainant. Thus, Commissioner Schmidtlein finds that the presence of some domestic inventory, regardless of the commercial significance, provides a basis to issue the cease and desist order.

Commissioner Schmidtlein does not join the Commission's statement that a complainant seeking a cease and desist order must demonstrate that the remedy is "necessary" to address the violation found in the investigation. It is unclear what the Commission intends to convey by the statement, but on its face it appears to limit the broad discretion granted to the Commission under section 337(f)(1). In Commissioner Schmidtlein's view, the House committee report cited by the Commission as support does not address the standard for determining whether a cease and desist order should issue. *See* H.R. Rep. No. 100-40, at 160 (1987). Instead, the committee report simply explains that the amendments to section 337(f)(1) under the Omnibus Trade and Competitiveness Act of 1988 authorize the Commission to issue both a cease and desist order and an exclusion order to remedy the same unfair act. *See id.* at 22, 159.

During the 60-day period of Presidential review, imported articles otherwise subject to remedial orders are entitled to conditional entry under bond. 19 U.S.C. § 1337(j)(3). The amount of the bond is specified by the Commission and must be an amount sufficient to protect the complainant from any injury. *Id;* 19 C.F.R. § 210.50(a)(3). The Commission frequently sets the bond by calculating the difference in sales prices between the patented domestic product and the infringing product or based upon a reasonable royalty. *Certain Microsphere Adhesives, Process For Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes,* Inv. No. 337-TA-366, Comm'n Op. at 24, USITC Pub. No. 2949 (Jan. 1996). In cases where the record does not contain sufficient evidence upon which to base a determination of the appropriate amount of the bond despite a complainant's effort to adduce such evidence, the Commission has set a 100 percent bond. *See Certain Sortation Systems, Parts Thereof, and Products Containing Same,* Inv. No. 337-TA-460, Comm'n Op. at 21 (Mar. 2003). Complainants bear the burden of establishing the need for a bond amount in the first place. *Certain Rubber Antidegradants, Components Thereof, and Prods. Containing Same,* Inv. No. 337-TA-533, Comm'n Op. at 39-40 (July 21, 2006).

The Commissions adopts the ALJ's recommendation and sets the bond at zero percent. The burden in proving that a bond is necessary falls on Cisco. Here, Mr. Leonard, Cisco's expert, offered conclusory testimony to assert that neither a reasonable royalty or price differential could be calculated. CX-0010C at Q/A 247-60. In addition, Cisco argues for the first time in its briefing before the Commission that, in the alternative, a five percent bond should be set. The evidence presented to the Commission on whether a five percent bond is appropriate was not well developed and there was no evidence in the RD to consider due to Cisco's failure to provide support for its request for a bond before the ALJ. Accordingly, the Commission sets the bond at zero percent.

D. Public Interest

Sections 337(d) and (f) of the Tariff Act of 1930, as amended, direct the Commission to consider certain public interest factors before issuing a remedy. These public interest factors include the effect of any remedial order on "the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers." 19 U.S.C. §§ 1337(d) and (f).

The Commission finds that the public interest does not preclude the issuance of a remedy in this investigation. Cisco asserts that there are no public interest concerns that prevent the issuance of a remedy in this investigation. Cisco Br. at 91-94. We agree with Cisco that (1) there are numerous alternative networking technologies, including those supplied by Cisco and others in the industry, (2) Cisco has the resources and supply chain to scale production to meet any increase in demand, and (3) there would be no harm to competitive conditions if Arista's products were excluded. *Id.*

The only public interest issue Arista raises is its assertion that the PVLAN patents are the subject of a *de facto* standard, thereby precluding issuance of a remedy for those patents. *See* Respondent Arista's Public Interest Submission Under 210.50(a) (March 17, 2016); Arista Br. at 84-108.[21] Arista admits that RFC 5517 is not a *de jure* standard. Arista Br. at 95-96. Instead,

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[21] Arista submitted letters from various third-parties on this issue, including [[

]]. The Commission has considered these submissions.

Arista argues that based on Cisco's actions that RFC 5517 should be found to be a *de facto* standard and that the PVLAN patents are essential.

Arista relies on Mr. HomChaudhuri's Linked-In page to argue that RFC 5517 is a *de facto* standard because it states that he helped develop *de facto* standard RFC 5517. Mr. HomChaudhuri's testified, however, that the statement on his Linked-In page was [[ ]] and explains that the intent of RFC 5517 was not to have others adopt PVLAN, but if they did, that they could see how the technology should behave. RX-53C at 76; *see also* JX-0051C at 248-49; CX-1222C at Q/A 57–61.

Arista also argues that Cisco promoted PVLAN within the industry such that it became a standard. Arista Br. at 86-88. Although other Cisco competitors have PVLAN functionality available, Arista cites no evidence that they adopted or relied on RFC 5517 or the PVLAN patents. Indeed, competitors are not required to practice the PVLAN patents or RFC 5517 because they are not part of a formal standard. Arista admits that [[ ]]. The mere fact that others in the industry offer PVLAN functionality, without more, does not demonstrate that they practice RFC 5517, the PVLAN patents, or that PVLAN is a *de facto* standard.

Arista also asserts that the PVLAN patents are essential based on Cisco's actions, including Cisco's filing of RFC 5517, tying of RFC 5517 to the PVLAN patents, and relying on Arista's implementation of RFC to show infringement. Arista Br. at 89-91. Cisco's submission to IETF, however, states that RFC 5517 is not a standard and *if* IETF adopts RFC 5517 as a standard *and* any claims of Cisco patents are necessary for practicing the standard, Cisco will offer its technology for licensing under FRAND terms. *See* RX-3852. Arista admits that these conditions have not been met. Arista Br. at 95. Without further action by Cisco to encourage others to adopt RFC 5517 or evidence that the industry has adopted RFC 5517 as a standard, the Commission finds that RFC 5517 is not a *de facto* standard. Arista also asserts that patent hold-up has occurred. *See, e.g.,* Arista Br. at 91-97. Here, however, there is no record evidence to support a finding that patent hold-up has occurred or is likely to occur. In particular, there is nothing on the record demonstrating the existence of an industry standard or that Cisco had an obligation to offer licenses with respect to the PLVAN patents on a fair, reasonable, and non-discriminatory basis. Consequently, there are no public interest concerns barring the issuance of a remedy in this investigation.

X. CONCLUSION

For the forgoing reasons, the Commission finds that a violation of section 337 has occurred.

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued: July 26, 2016

CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I) **Inv. No. 337-TA-944**

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **COMMISSION OPINION** has been served by hand upon the Commission Investigative Attorney, Andrew Beverina, Esq., and the following parties as indicated, on **July 26, 2016**.

Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

On Behalf of Complainant Cisco Systems, Inc.:

D. Sean Trainor, Esq.
KIRKLAND & ELLIS LLP
655 15th Street, NW
Washington, DC 20005

☐ Via Hand Delivery
☒ Via Express Delivery
☐ Via First Class Mail
☐ Other:____________

On Behalf of Respondent Arista Networks, Inc.:

Lauren A. Degnan, Esq.
FISH & RICHARDSON P.C.
1425 K Street, NW, 11th Floor
Washington, DC 20005

☐ Via Hand Delivery
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US INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I)**	**Investigation No. 337-TA-944**

LIMITED EXCLUSION ORDER

The United States International Trade Commission ("Commission") has determined that there is a violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the unlawful importation, sale for importation, or sale within the United States after importation by Respondents Arista Networks, Inc. ("Arista" or "Respondent") of certain network devices, related software and components thereof that infringe one or more of claims 1, 2, 8-11, and 17-19 of U.S. Patent No. 7,162,537 ("the '537 patent"); claims 6, 7, 20, and 21 of U.S. Patent No. 6,741,592 ("the '592 patent"); and claims 5, 7, 45, and 46 of U.S. Patent No. 7,200,145 ("the '145 patent").

Having reviewed the record in this investigation, including the written submissions of the parties, the Commission has made its determination on the issues of remedy, public interest, and bonding. The Commission has determined that an appropriate form of relief is a limited exclusion order prohibiting the unlicensed entry of network devices, related software and components thereof manufactured by or on behalf of Respondent or its affiliated companies, parents, subsidiaries, licensees, or other related business entities, or their successors or assigns.

The Commission has also determined that the public interest factors enumerated in 19 U.S.C. § 1337(d) do not preclude the issuance of the limited exclusion order.

During the Presidential review period, the Commission has further determined to set a zero bond for the network devices, related software and components thereof that are manufactured by, for, or on behalf of Arista.

Accordingly, the Commission hereby **ORDERS** that:

1. Network devices, related software and components thereof that infringe one or more of 1, 2, 8-11, and 17-19 of the '537 patent; claims 6, 7, 20, and 21 of the '592 patent; and claims 5, 7, 45, and 46 of the '145 patent that are manufactured abroad by or on behalf of, or imported by or on behalf of, Respondent, or its affiliated companies, parents, subsidiaries, licensees, or other related business entities, or its successors or assigns, are excluded from entry for consumption into the United States, entry for consumption from a foreign trade zone, or withdrawal from a warehouse for consumption, for the remaining terms of the patents, except under license of the patent owner or as provided by law, and except for service, repair, or replacement articles imported for use in servicing, repairing, or replacing network devices under warranty or service contracts, for identical articles, that existed as of the date of this Order.

2. Notwithstanding paragraph 1 of this Order, the aforesaid network devices, related software and components thereof are entitled to entry into the United States for consumption, entry for consumption from a foreign-trade zone, or withdrawal from a warehouse for consumption under zero bond by, for, on or behalf of Arista pursuant to subsection (j) of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337(j)), and the Presidential Memorandum for the United States Trade Representative of July 21, 2005 (70 *Fed. Reg.* 43251), from the day

after this Order is received by the United States Trade Representative until such time as the United States Trade Representative notifies the Commission that this Order is approved or disapproved but, in any event, not later than sixty (60) days after the date of receipt of this Order.

3. At the discretion of U.S. Customs and Border Protection ("CBP") and pursuant to the procedures it establishes, persons seeking to import network devices, related software and components thereof that are potentially subject to this Order may be required to certify that they are familiar with the terms of this Order, that they have made appropriate inquiry, and thereupon state that, to the best of their knowledge and belief, the products being imported are not excluded from entry under paragraph 1 of this Order. At its discretion, CBP may require persons who have provided the certification described in this paragraph to furnish such records or analyses to substantiate the certification.

5. In accordance with 19 U.S.C. § 1337 (l), the provisions of this Order shall not apply to network devices, related software and components thereof that are imported by and for the use of the United States, or imported for, and to be used for, the United States with the authorization or consent of the Government.

6. The Commission may modify this Order in accordance with the procedures described in section 210.76 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.76).

7. The Secretary shall serve copies of this Order upon each party of record in this investigation.

8. Notice of this Order shall be published in the Federal Register.

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued: June 23, 2016

CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I) **Inv. No. 337-TA-944**

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **ORDER** has been served by hand upon the Commission Investigative Attorney, Andrew Beverina, Esq., and the following parties as indicated, on **June 23, 2016**.

Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

On Behalf of Complainant Cisco Systems, Inc.:

D. Sean Trainor, Esq.
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655 15th Street, NW
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On Behalf of Respondent Arista Networks, Inc.:

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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I)**	**Investigation No. 337-TA-944**

CEASE AND DESIST ORDER

IT IS HEREBY ORDERED THAT Arista Networks, Inc. cease and desist from conducting any of the following activities in the United States: importing, selling, marketing, advertising, distributing, transferring (except for exportation), soliciting United States agents or distributors, and aiding or abetting other entities in the importation, sale for importation, sale after importation, transfer (except for exportation), or distribution of certain network devices, related software and components thereof that infringe one or more of claims 1, 2, 8-11, and 17-19 of U.S. Patent No. 7,162,537 ("the '537 patent"); claims 6, 7, 20, and 21 of U.S. Patent No. 6,741,592 ("the '592 patent"); and claims 5, 7, 45, and 46 of U.S. Patent No. 7,200,145 ("the '145 patent") in violation of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337).

I.
Definitions

As used in this order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Cisco Systems, Inc. of San Jose, California ("Cisco").

(C) "Respondent" shall mean Arista Networks, Inc. of Santa Clara, California ("Arista").

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority-owned or controlled subsidiaries, successors, or assigns.

(E) "United States" shall mean the fifty States, the District of Columbia, and Puerto Rico.

(F) The terms "import" and "importation" refer to importation for entry for consumption under the Customs laws of the United States.

(G) The term "covered products" shall mean network devices, related software and components thereof that infringe one or more of claims 1, 2, 8-11, and 17-19 of the '537 patent; claims 6, 7, 20, and 21 of the '592 patent; and claims 5, 7, 45, and 46 of the '145 patent.

II.
Applicability

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by section III, *infra*, for, with, or otherwise on behalf of, Respondent.

III.
Conduct Prohibited

The following conduct of Respondent in the United States is prohibited by this Order. For the remaining term of the relevant '537 patent, '592 patent and '145 patent, Respondent shall not:

(A) import or sell for importation into the United States covered products;

(B) market, distribute, sell, or otherwise transfer (except for exportation) imported covered products;

(C) advertise imported covered products;

(D) solicit U.S. agents or distributors for imported covered products; or

(E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer, or distribution of covered products.

IV.
Conduct Permitted

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if,

(A) in a written instrument, the owner of the '537 patent, '592 patent and '145 patent licenses or authorizes such specific conduct, or such specific conduct is related to the importation or sale of covered products by or for the United States;

(B) the conduct is limited to provision of service, repair, or replacement articles imported for use in servicing, repairing, or replacing network devices under warranty or service contracts, for identical articles, that existed prior to the date of this Order.

V.
Reporting

For purposes of this requirement, the reporting periods shall commence on January 1 of each year and shall end on the subsequent December 31. The first report required under this section shall cover the period from the date of issuance of this order through December 31, 2016. This reporting requirement shall continue in force until such time as Respondent has truthfully reported, in two consecutive timely filed reports, that it has no inventory of covered products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to the Commission: (a) the quantity in units and the value in dollars of covered products that it has (i) imported and/or (ii) sold in the United States after importation during the reporting period, and (b) the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

When filing written submissions, Respondent must file the original document electronically on or before the deadlines stated above and submit eight (8) true paper copies to the Office of the Secretary by noon the next day pursuant to section 210.4(f) of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.4(f)). Submissions should refer to the investigation number ("Inv. No. 337-TA-944") in a prominent place on the cover pages and/or the first page. *See* Handbook for Electronic Filing Procedures, http://www.usitc.gov/secretary/fed_reg_notices/rules/handbook_on_electronic_filing.pdf. Persons with questions regarding filing should contact the Secretary (202-205-2000). If Respondent desires to submit a document to the Commission in confidence, it must file the original and a public version of the original with the Office of the Secretary and must serve a copy of the confidential version on Complainant's counsel.[1]

Any failure to make the required report or the filing of any false or inaccurate report shall constitute a violation of this Order, and the submission of a false or inaccurate report may be referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. § 1001.

[1] Complainant must file a letter with the Secretary identifying the attorney to receive reports and bond information associated with this Order. The designated attorney must be on the protective order entered in the investigation.

VI.
Record-Keeping and Inspection

(A) For the purpose of securing compliance with this Order, Respondent shall retain any and all records relating to the sale, offer for sale, marketing, or distribution in the United States of covered products, made and received in the usual and ordinary course of business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purposes of determining or securing compliance with this Order and for no other purpose, subject to any privilege recognized by the federal courts of the United States, and upon reasonable written notice by the Commission or its staff, duly authorized representatives of the Commission shall be permitted access and the right to inspect and copy, in Respondent's principal offices during office hours, and in the presence of counsel or other representatives if Respondent so chooses, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, in detail and in summary form, that must be retained under subparagraph VI(A) of this Order.

VII.
Service of Cease and Desist Order

Respondent is ordered and directed to:

(A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of its respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, or sale of imported covered products in the United States;

(B) Serve, within fifteen (15) days after the succession of any persons referred to in subparagraph VII(A) of this order, a copy of the Order upon each successor; and

(C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the expiration dates of the '537 patent, '592 patent and '145 patent.

VIII.
Confidentiality

Any request for confidential treatment of information obtained by the Commission pursuant to section VI of this order should be made in accordance with section 201.6 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 201.6). For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

IX.
Enforcement

Violation of this order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.75), including an action for civil penalties under section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)), as well as any other action that the Commission deems appropriate. In determining whether Respondent is in violation of this order, the Commission may infer facts adverse to Respondent if it fails to provide adequate or timely information.

X.
Modification

The Commission may amend this order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.76).

XI.
Bonding

The conduct prohibited by section III of this order may be continued during the sixty-day period in which this Order is under review by the United States Trade Representative, as delegated by the President (70 *Fed. Reg.* 43,251 (Jul. 21, 2005)), under a bond of zero percent. This bond provision does not apply to conduct that is otherwise permitted by section IV of this Order. Covered products imported after the date of issuance of this Order are subject to the entry bond as set forth in the exclusion order issued by the Commission, and are not subject to this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* 19 C.F.R. § 210.68. The bond and any accompanying documentation are to be provided to and approved by the Commission prior to the commencement of conduct that is otherwise prohibited by section III of this Order. Upon the Secretary's acceptance of the bond, (a) the Secretary will serve an acceptance letter on all parties, and (b) Respondent must serve a copy of the bond and accompanying documentation on Complainant's counsel.[2]

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[2] *See* Footnote 1.

The bond is to be forfeited in the event that the United States Trade Representative approves this Order (or does not disapprove it within the review period), unless (i) the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or (ii) Respondent exports or destroys the products subject to this bond and provides certification to that effect that is satisfactory to the Commission.

This bond is to be released in the event the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved (or not disapproved) by the United States Trade Representative, upon service on Respondent of an order issued by the Commission based upon application therefore made by Respondent to the Commission.

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued: June 23, 2016

CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I) **Inv. No. 337-TA-944**

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **ORDER** has been served by hand upon the Commission Investigative Attorney, Andrew Beverina, Esq., and the following parties as indicated, on **June 23, 2016**.

Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

On Behalf of Complainant Cisco Systems, Inc.:

D. Sean Trainor, Esq.
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655 15th Street, NW
Washington, DC 20005

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UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C. 20436

In the Matter of **CERTAIN NETWOK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I)**	**Investigation No. 337-TA-944**

INITIAL DETERMINATION

Administrative Law Judge David P. Shaw

Pursuant to the notice of investigation, 80 Fed. Reg. 4314 (January 27, 2015), this is the initial determination in *Certain Network Devices, Related Software and Components Thereof (I)*, United States International Trade Commission Investigation No. 337-TA-944.

It is held that a violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain network devices, related software and components thereof with respect to asserted claims 1, 2, 8-11, and 17-19 of U.S. Patent No. 7,162,537; asserted claims 6, 7, 20, and 21 of U.S. Patent No. 6,741,592; and asserted claims 5, 7, 45, and 46 of U.S. Patent No. 7,200,145.

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The following abbreviations may be used in this Initial Determination:

ALJ	Administrative Law Judge
Br.	Post-Hearing Brief
CDX	Complainant's Demonstrative Exhibit
Compl.	Complainant or Complainant's
CPX	Complainant's Physical Exhibit
CX	Complainant's Exhibit
Dep.	Deposition
DHCP	Dynamic Host Configuration Protocol
DWS	Direct Witness Statement
EDIS	Electronic Document Imaging System
JDX	Joint Demonstrative Exhibit
JPX	Joint Physical Exhibit
JX	Joint Exhibit
MPEP	Manual of Patent Examining Procedure
PTO	U.S. Patent and Trademark Office
Q/A	Question and Answer
RDX	Respondent's Demonstrative Exhibit
Resp.	Respondent or Respondent's
RPX	Respondent's Physical Exhibit
RWS	Rebuttal Witness Statement
RX	Respondent's Exhibit

SDX	Staff's Demonstrative Exhibit
SPX	Staff's Physical Exhibit
SRWS	Supplemental Rebuttal Witness Statement
SWS	Supplemental Witness Statement
SX	Staff's Exhibit
Tr.	Transcript
WS	Witness Statement

I. Background

A. Institution of the Investigation

By publication of a notice in the *Federal Register* on January 27, 2015, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, the Commission instituted this investigation to determine:

> [W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain network devices, related software and components thereof by reason of infringement of one or more of claims 1, 2, 8-11, and 17-19 of the '537 patent [U.S. Patent No. 7,162,537]; claims 1, 6, and 12 of the '296 patent [U.S. Patent No. 8,356,296]; claims 1, 5, 6, 9, and 18 of the '164 patent [U.S. Patent No. 7,290,164]; claims 1, 14, 15, 29, 39-42, 63, 64, 71-73, and 84-86 of the '597 patent [U.S. Patent No. 7,340,597]; claims 6-10, 17, 18, 20, 21, 23, and 24 of the '592 patent [U.S. Patent No. 6,741,592]; claims 1, 3, 5, 7-11, 13, 15-29, 33-37, and 39-46 of the '145 patent [U.S. Patent No. 7,200,145], and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

80 Fed. Reg. 4134 (Jan. 27, 2015).

The Commission named as complainant Cisco Systems, Inc. of San Jose, California. *Id.*

The Commission named as respondent Arista Networks, Inc. of Santa Clara, California. *Id.*

The Office of Unfair Import Investigations ("Staff" or "OUII") was also named as a party to the investigation. *Id.*

B. Procedural History

The target date for completion of this investigation was set at 16 months, *i.e.*, May 27, 2016. Order No. 3 (Jan. 28, 2015). The deadline for this initial determination was therefore set for January 27, 2016. *Id.*

Cisco moved to terminate the investigation in part as to the following asserted claims:

- U.S. Patent No. 8,356,296: claims 1, 6, and 12 (all asserted claims);
- U.S. Patent No. 7,340,597: claims 40-42 and 84-86;
- U.S. Patent No. 6,741,592: claims 8-10, 17-18, and 23-24; and
- U.S. Patent No. 7,200,145: claims 1, 3, 8-10, 11, 13, 15-29, 33-37, and 39-44.

The administrative law judge granted the motion in an initial determination. Order No. 19 (Aug. 21, 2015), *aff'd*, Notice of the Commission's Determination Not to Review an Initial Determination Terminating the Investigation As to Certain Claims (Sept. 9, 2015).

A prehearing conference was held on September 9, 2015, with the evidentiary hearing in this investigation beginning immediately thereafter. The hearing concluded on September 16, 2015. *See* Order No. 6 (Mar. 9, 2015); Prehearing Tr. 1-24 (Sept. 10, 2015); Hearing Tr. 1-1494. The parties were requested to file post-hearing briefs not to exceed 450 pages, and to file reply briefs not to exceed 150 pages. Prehearing Tr. 10 (Sept. 10, 2015).

Following the submission of post-hearing briefs, Arista submitted a Notice of New Authority (EDIS Doc. No. 570796) (Dec. 15, 2015) addressing the economic prong of the domestic industry requirement. Cisco submitted a response to Arista's Notice (EDIS Doc. No. 572194) (Jan 11, 2016).

On January 27, 2016, the administrative law judge issued Order No. 27, an initial determination extending the target date of this investigation to June 2, 2016. The deadline for this initial determination is therefore February 2, 2016.

C. The Private Parties

Cisco Systems, Inc. is a corporation organized and existing under the laws of California, having its principal place of business at 170 West Tasman Drive, San Jose, California, 95134. Compl. ¶ 7.

Arista Networks, Inc. is a corporation organized and existing under the laws of Delaware, having its principal place of business at 5453 Great America Parkway, Santa Clara, California, 95134. *See* Compl. ¶ 12; Resp. ¶ 12.

II. Jurisdiction and Standing

A. Subject Matter Jurisdiction

No party has contested the Commission's jurisdiction over the subject matter of this investigation. *See, e.g.*, Compl. Br. at 41-42; Resp. Br at 34; Staff Br. at 8. Indeed, as indicated in the Commission's notice of investigation, discussed above, this investigation involves the alleged importation of products that infringe United States patents in a manner that violates section 337 of the Tariff Act, as amended. Accordingly, it is found that the Commission has subject matter jurisdiction over this investigation.

B. Personal Jurisdiction

No party has contested the Commission's personal jurisdiction over it. *See, e.g.*, Compl. Br. at 42; Resp. Br. at 34; Staff Br. at 8. Indeed, all parties appeared at the evidentiary hearing, and presented evidence. It is found that the Commission has personal jurisdiction over all parties.

C. *In Rem* Jurisdiction and Importation

1. Importation of the Accused Products

The Commission has *in rem* jurisdiction when infringing articles are imported, sold for importation, or sold within the United States after importation by the owner, importer, or consignee. 19 U.S.C. § 1337(a)(1)(B); *see also* 80 Fed. Reg. 4134 (Jan. 27, 2015) (Notice of Investigation). It has long been recognized that an importation of even one accused product can satisfy the importation requirement of section 337. *See Certain Trolley Wheel Assemblies*, Inv.

No. 337-TA-161, Comm'n Op. at 7-8, USITC Pub. No. 1605 (Nov. 1984) (deeming the importation requirement satisfied by the importation of a single product of no commercial value).

Arista has argued that a violation of section 337 cannot be found in this investigation because [

]. *See, e.g.*, CX-1009C (Arista's First Supplemental Response to Interrogatory No. 40); *see also* Metivier Tr. 1161.

The evidence demonstrates, however, that the accused products have been imported into the United States [ ]. *See, e.g.*, CX-0597C; CX-1009C; JX-0029C; CX-1213C; Metivier Tr. 1160-1161, 1165; Duda Tr. 821-822 ("[

]."). For example, Mr. Metivier, Arista's Vice President of Manufacturing and Platform engineering, testified that [

]. Metivier Tr. 1168, 1172. Arista's Chief Technology Officer, Mr. Kenneth Duda, also testified that [

]. Duda Tr. 823.

Therefore, it is determined that the Commission has *in rem* jurisdiction over the accused products pursuant to 19 U.S.C. § 1337(a).

2. Importation of Hardware Components

The Commission has *in rem* jurisdiction over "articles that . . . infringe" a United States patent, a set that includes components used in, or are otherwise a part of, contributory and induced infringement under 35 U.S.C. § 271(b), (c). *Suprema, Inc. v. Int'l Trade Comm'n*, 796 F.3d 1338, 1346 (Fed. Cir. 2015) (*en banc*) ("'[I]nfringement' is a term that encompasses both direct and indirect infringement, including infringement by importation that induces direct infringement of a method claim."); *see Certain Digital Media Devices Including Televisions, Blu-Ray Disc Players, Home Theater Sys., Tablets & Mobile Phones, Components Thereof & Associated Software*, Inv. No. 337-TA-882, Final Initial Determination (Aug. 7, 2014) ("*Certain Digital Media Devices*"). The Commission therefore has jurisdiction over articles that contribute to or induce direct infringement, even if direct infringement occurs after importation into the United States. *Suprema*, 796 F.3d at 1347, 1348; *Certain Digital Media Devices* at 22-23.

The record evidence establishes that, [ ]. *See, e.g.*, CX-1009C; JX-0029C; CX-0597C. Cisco alleges that this [ ]. *See, e.g.*, Compl. Br. at 375-405. It is argued that the [ ]. *See, e.g.*, Compl. Br. at 45 (citing Duda Tr. 861; Metivier Tr. 1167, 1173; CX-0035C; CX-0038C; CX-0040C; JX-0026C (Duda Dep. Tr.) 204-205, 266, 267-268, 273-275; JX-0031C (Pech Dep. Tr.) 140-141).

Therefore, it is determined that the Commission has *in rem* jurisdiction over the switch hardware, inasmuch as they constitute "articles that . . . infringe" pursuant to section 337 and the Federal Circuit's *en banc* decision in *Suprema*.

D. Ownership of the Asserted Patents

The asserted patents have each been assigned to Cisco, and the assignments have been recorded with the U.S. Patent and Trademark Office. *See* JX-0013; JX-0015; JX-0016; JX-0017; JX-0018. It is therefore determined that Cisco has standing to bring this enforcement action against Arista.

III. The Asserted Patents

A. U.S. Patent No. 7,162,537

1. Overview of the Technology

The '537 patent is generally directed to a system and method for managing data in networking devices. JX-0001 ('537 patent) at Abstract. In particular, the '537 patent concerns the use of router subsystems to externally manage router configuration data stored in a centralized database, referred to as "sysDB." The '537 patent teaches that, although prior art systems used a centralized database (*i.e.*, sysDB) to store router configuration data, none allowed the subsystems to manage the data.

As the '537 patent explains, network devices, such as routers and switches, transfer network messages and packets within a network or between networks. JX-0001 at col. 1, lns. 19-22. These network devices typically use an operating system to control the functionality needed to operate. *Id.* at col. 1, lns. 14-18. Network devices also can use a number of specialized subsystems to perform specific functionality. *Id.* at col. 1, lns. 37-38. For example, the IP subsystem handles IP address information, and the AAA subsystem deals with user authentication information. *Id.* at col. 4, lns. 9-11. The '537 patent teaches that prior art operating systems generally used one of two approaches. In the first approach, devices relied on each subsystem to manage the specific functions for which it was responsible. *Id.* at col. 1, lns.

37-40. Although this technique allowed each subsystem to focus on a specific process, it suffered from several drawbacks. In particular, each of the subsystems often had "multiple dependencies with other client subsystem[s]." *Id.* at col. 1, lns. 37-47. These multiple dependencies hindered device performance, for example, by making "common transactions cumbersome and unnecessarily complicated." *Id.* at col. 1, lns. 48-67.

In the second approach, a centralized database system was used to manage network device transactions. JX-0001 ('537 patent) at col. 2, lns. 42-49. The inventor of the '537 patent, Mr. Pradeep Kathail, along with others at Cisco, was awarded U.S. 6,704,752 ("Kathail '752") regarding this centralized database approach. CX-0006C (Kathail WS) at Q/A 42-43; CX-1150. Prior art systems implementing this approach helped to reduce or avoid multiple dependencies among client subsystems by using a central point of coordination. JX-0001 ('537 patent) at col. 2, lns. 55-57. In the system of Kathail '752, for example, "[t]he centralized database system manages a storage structure . . . contain[ing] configuration data for the router. The centralized database then carries out the configuration change in the appropriate tuple[1] node using the configuration information provided in the configuration command issued by the user." CX-1150 at Abstract (emphasis added). Mr. Kathail received additional patents—U.S. Patent Nos. 6,952,703 ("Kathail '703") and 6,728,723 ("Kathail '723")—relating to how the centralized database in this approach would verify and notify others of transactions. CX-0006C (Kathail WS) at Q/A 42-43; CX-1150. As the '537 patent explains, this second approach also suffers from drawbacks. *See* CX-0006C (Kathail WS) at Q/A 42-43. For example, a centrally managed

[1] In this instance, a tuple is a node on a data storage tree structure. *See* CX-0007C (Almeroth WS) at Q/A 373.

system is inefficient because it requires one database to perform the transactions continuously on stored data, taxing the central database:

> However, the centralized database scheme is somewhat inefficient when the information stored in the database contains a large amount of data or is changing very fast. For example, when the data in the database is constantly changing (such as statistic counters), the sysDB may have to continuously perform transaction routines, notification routines, and verification routines.

JX-0001 ('537 patent) at col. 2, ln. 58 – col. 3, ln. 38.

The central database is also needed to coordinate the activities of all of the individual subsystems, which requires burdensome logic and processing. *See* CX-0006C (Kathail WS) at Q/A 42-43, 57; CX-0007C (Almeroth WS) at Q/A 41.

2. Overview of the '537 Patent

Asserted U.S. Patent No. 7,162,537 ("the '537 patent") is titled, "Method and System for Externally Managing Router Configuration Data in Conjunction With a Centralized Database." JX-0001 ('537 patent). The '537 patent issued on January 9, 2007, and the named inventor is Pradeep Kathail. *Id.*

To address the problems present in the prior art, the '537 patent provides "a method and system for externally managing router configuration data in conjunction with a centralized database [that] allows the various subsystems of the IOS to be modular and independent." *See* JX-0001 ('537 patent) at col. 3, lns. 13-16. As such, the system of the '537 patent maintains modularity by using a centralized database while at the same time reducing some of the computational burden of that centralized database by allowing external subsystems to manage data. *Id.* at col. 3, lns. 13-19. In this way, modularity and independence is achieved without the drawback of multiple dependencies among client subsystems. *See id.*; CX-0007C (Almeroth WS) at Q/A 42.

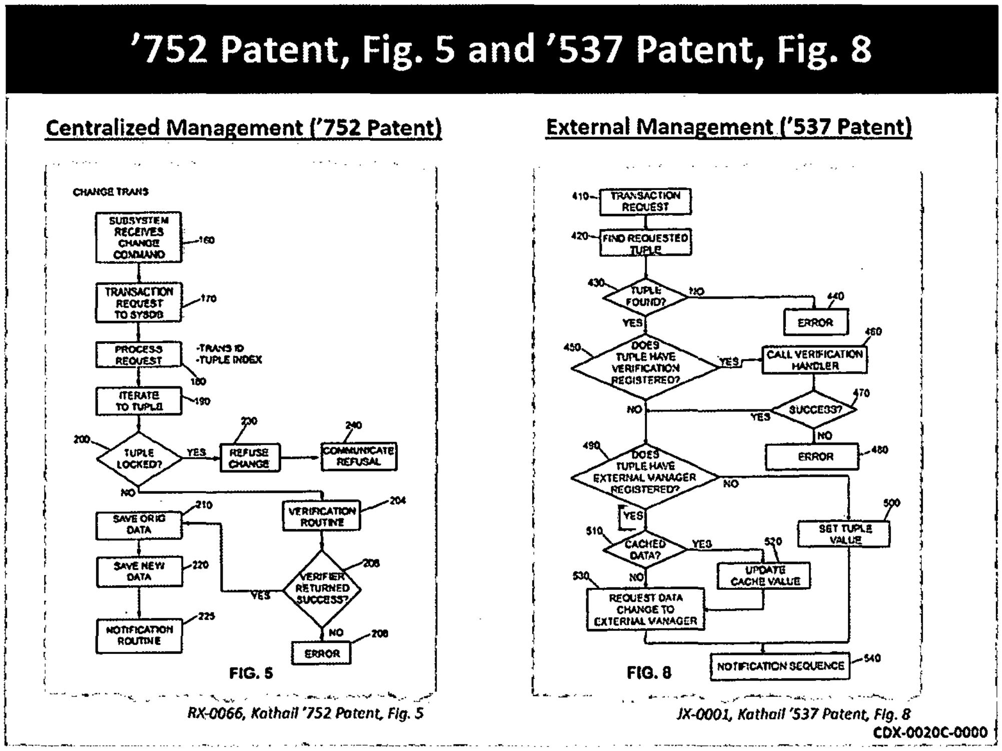
The operating system contemplated in the '537 patent includes a database subsystem, sysDB, along with several other subsystems coupled to sysDB, such as an IP subsystem, an Ethernet subsystem, a dialer subsystem, an authentication subsystem, and a point-to-point protocol subsystem. JX-0001 ('537 patent) at col. 7, lns 46-55. As the '537 patent explains, subsystems can submit a registration request to sysDB to externally manage certain router configuration data:

> A managing subsystem registers for external data managing services with the sysDB by transmitting a "managing" registration request. The managing subsystem may register to externally manage router configuration data which would otherwise be maintained within the sysDB tree. Accordingly, the managing subsystem may register to externally manage an individual tuple of the sysDB tree or an entire sub-tree (or namespace) of the sysDB tree.

Id. at col. 5, lns. 18-25.

According to the '537 patent, its invention differs from prior art systems in a number of ways. For example, whereas in the prior art systems "the centralized database . . . carries out the configuration change," the system of the '537 patent transfers that role to the external managing subsystem. JX-0001 ('537 patent) at col. 14, ln. 65 – col. 15, ln. 2; *see* CX-1150 at col. 3, lns. 41-44. Compared to the prior art, external management also allows the central database to avoid certain processing required to coordinate modifications to data stored within. *See* CX-0007C (Almeroth WS) at Q/A 42, Q/A 47.

Some benefits of external management are seen by comparing the steps for updating data in the '537 patent using an external manager (Figure 8) with the steps for updating data in the prior art Kathail '752 patent using sysDB without external management (Figure 5). As shown below in demonstrative CDX-0020C-0000, prior art systems required significant functionality that was rendered unnecessary with external management. For example, Kathail '752 requires that several tasks be performed by the centralized database system when a change is requested, inasmuch as the centralized database system is the manager. These tasks include checking whether the data is locked in step 200, refusing the change in step 230 if the data were locked, and then communicating that refusal in step 240:


'752 Patent, Fig. 5 and '537 Patent, Fig. 8
Centralized Management ('752 Patent)
CHANGE TRANS
SUBSYSTEM RECEIVES CHANGE COMMAND
160
TRANSACTION REQUEST TO SYSDB
170
PROCESS REQUEST
-TRANS ID
-TUPLE INDEX
180
ITERATE TO TUPLE
190
200
TUPLE LOCKED?
YES
230
REFUSE CHANGE
240
COMMUNICATE REFUSAL
NO
VERIFICATION ROUTINE
204
210
SAVE ORIG DATA
SAVE NEW DATA
220
VERIFIER RETURNED SUCCESS?
206
YES
NO
208
ERROR
NOTIFICATION ROUTINE
225
FIG. 5
RX-0066, Kathail '752 Patent, Fig. 5
External Management ('537 Patent)
410
TRANSACTION REQUEST
420
FIND REQUESTED TUPLE
430
TUPLE FOUND?
NO
440
ERROR
YES
450
DOES TUPLE HAVE VERIFICATION REGISTERED?
YES
CALL VERIFICATION HANDLER
460
NO
SUCCESS?
470
YES
NO
ERROR
480
490
DOES TUPLE HAVE EXTERNAL MANAGER REGISTERED?
NO
YES
500
SET TUPLE VALUE
510
CACHED DATA?
YES
520
UPDATE CACHE VALUE
530
NO
REQUEST DATA CHANGE TO EXTERNAL MANAGER
NOTIFICATION SEQUENCE
540
FIG. 8
JX-0001, Kathail '537 Patent, Fig. 8
CDX-0020C-0000

CDX-0020C-0000 (citing CX-1150 (Kathail '752) at Fig. 5; JX-0001 ('537 patent) at Fig. 8).

These steps were all required in the context of the '752 patent because sysDB managed all the data, and therefore managed access to the data by the subsystems. CX-0007C (Almeroth WS) at Q/A 169. By contrast, the '537 patent does not require that those tasks be carried out by the centralized database. Rather, the subsystems responsible for the data manage them directly, and it is therefore unnecessary for the centralized database to lock and unlock the data or otherwise to manage access to the data by the subsystems. *Id.* The computational steps required for centralized management of data that are depicted in Figure 5 the '752 patent are absent when external management is available, as shown in Figure 8 of the '537 patent. CX-0007C (Almeroth WS) at Q/A 169; JX-0001 ('537 patent) at Figs. 5, 8. Moreover, if the data are not externally managed, the '537 patent indicates in box 500 of Figure 8 that data updates are handled according to the method disclosed in Kathail '752. JX-0001 ('537 patent) at Fig. 8; col. 14, lns. 44-54.

Thus, the claimed inventions of the '537 patent provide independence between the various subsystems of the IOS by eliminating dependencies between multiple individual subsystems through the use of a centralized database. JX-0001 ('537 patent) at col. 5, lns. 41-50. The '537 patent also teaches that the claimed inventions avoid and reduce the disadvantages associated with such a database by allowing individual subsystems to manage the data outside of the database. *Id.*

3. The Asserted Claims

Cisco asserts independent claims 1, 10, and 19 from the '537 patent, as well as dependent claims 2, 8, 9, 11, 17, and 18.[2] The relevant claims read as follows:

> 1. A method for reducing computational overhead in a centralized database system by externally managing router data in conjunction with a centralized database subsystem, said database subsystem operatively coupled for communication with a plurality of router subsystems one of which is a first managing subsystem, comprising:
>
> a) transmitting a management registration request by said first managing subsystem to said database subsystem, said registration request indicating router configuration data for which said first managing subsystem is requesting to provide external management

[2] Cisco relies on claims 1, 2, 8, 10, 11, 17, and 19 of the '537 patent to argue satisfaction of the technical prong of the domestic industry requirement. *See* Compl. Br. at 27.

services, said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database;

b) receiving said management registration request by said database subsystem; and

c) registering said first managing subsystem for external management by said database subsystem.

2. The method of claim 1 further comprising maintaining router configuration data using a tree structure having a plurality of tuples by said database system.

8. The method of claim 1 further comprising:

(a) transmitting a change request for router data by a requesting subsystem to said database subsystem;

(b) receiving said change request by said database subsystem;

(c) determining whether said router data is externally managed by a second managing subsystem; and

(d) requesting a data change for said router data to said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem.

9. The method of claim 8 further comprising:

a) determining whether said router data is locally cached; and

b) updating the cache value to said router data when said router data is locally cached.

10. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for reducing computational overhead in a centralized database system by externally managing router data in conjunction with a centralized database subsystem, said database subsystem operatively coupled for communication with a plurality of router subsystems one of which is a first managing subsystem, said method comprising:

(a) transmitting a management registration request by said first managing subsystem to said database subsystem, said registration request indicating router configuration data for which said first managing subsystem is requesting to provide external management services, said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database;

(b) receiving said management registration request by said database subsystem; and

(c) registering said first managing subsystem for external management by said managing subsystem.

11. The program storage device of claim 10, said method further comprising maintaining router configuration data using a tree structure having a plurality of tuples by said database system.

17. The program storage device of claim 10, said method further comprising:

(a) transmitting a change request for router data by a requesting subsystem to said database subsystem;

(b) receiving said change request by said database subsystem;

(c) determining whether said router data is externally managed by a second managing subsystem; and

(d) requesting a data change for said router data to said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem.

18. The program storage device of claim 17, said method further comprising:

(a) determining whether said router data is locally cached; and

(b) updating the cache value to said router data when said router data is locally cached.

19. In a router device having a processor and memory, a router operating system executing within said memory comprising:

(a) a database subsystem;

> (b) a plurality of client subsystems, each operatively coupled for communication to said database subsystem, one of said client subsystems configured as a managing subsystem to externally manage router data upon issuing a management request to said database subsystem; and
>
> (c) a database operatively coupled to said database subsystem, said database configured to store router configuration data and delegate management of router configuration data to a management subsystem that requests to manage router configuration data, said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database.

4. The '537 Products at Issue

a. Accused Arista Products

The Accused '537 Products are Arista's 7010, 7048, 7050, 7050X, 7150, 7250X, 7280E, 7300, 7300X, and 7500E series switches. *See* CX-0007C (Almeroth WS) at Q/A 24. Arista switches, including the switches named above, run Arista's "Extensible Operating System," or "EOS." CX-0007C (Almeroth WS) at Q/A 82; CX-0179. At the center of EOS is "Sysdb," a centralized database that Cisco contends contains the complete state of the system and interfaces with various subsystems called "agents." CX-0286 at 4-5; *see also* CX-0007C (Almeroth WS) at Q/A 85; JX-0026C (Duda Dep. Tr.) at 37-38.

b. Cisco Domestic Industry Products

Cisco's '537 Domestic Industry Products are the CRS-1, XR 12000, and the ASR 9000 platforms, which use Cisco's IOS XR operating system. Mr. Kathail, the named inventor of the '537 patent, worked on IOS XR under its previous name of IOS ENA. CX-0006C (Kathail WS) at Q/A 10, Q/A 17-18, Q/A 99. IOS XR uses a centralized database called SysDB. *Id.* at Q/A 19; CX-0007C (Almeroth WS) at Q/A 284. In IOS XR, a subsystem process may register with

SysDB to be an "External Data Manager" (or "EDM") for a particular set of data that it identifies in a registration request. CX-0471C; CX-0007C (Almeroth WS) at Q/A 284-294.

B. U.S. Patent No. 7,340,597

1. Overview of the Technology

The invention of the '597 patent is a computer networking communications device invented by Arista founder David Cheriton while he working as an engineer at Cisco. The '597 patent relates to communication networks, which allow for access to information and services provided by remote devices. JX-0004 ('597 patent) at col. 1, lns. 12-16. Convenient access to remote information and services makes it easier for an attacker to take over networked communications devices, however, to cripple the network or "to proceed with further compromise of the network's security." *Id.* at col. 1, lns. 35-36.

The '597 patent teaches that prior attempts to implement a secure, robust, and flexible logging and reporting mechanism to monitor system changes on communications devices as they occurred typically relied on network monitors external to the communications devices. JX-0004 at col. 2, lns. 7-20. These implementations suffered from multiple problems unique to monitoring security threats in networked environments. First, attacking a router or other devices between a given communications device and its associated network monitor could disable the monitor's access to data and ability to function properly. *Id.* at col. 1, lns. 30-38; col. 2, lns. 16-20. Second, configuration changes reported by a device to an external monitor may cause a network administrator to disable or isolate the device where the change is severe enough to warrant its quarantine. *Id.* at col. 5, lns. 5-16. Third, an external network monitor itself is a target for attacks. *Id.* at col. 1, lns. 30-38; col. 2, lns. 13-20.

2. Overview of the '597 Patent

Asserted U.S. Patent No. 7,340,597 ("the '597 patent") is titled, "Method and Apparatus for Securing a Communications Device Using a Logging Module." JX-0004 ('597 patent). The '597 patent issued on March 4, 2008, and the named inventor is David R. Cheriton. *Id.*

To address the problems in the prior art, David Cheriton developed the inventions claimed in the '597 patent while working at Cisco. The device includes a "logging module" coupled to a subsystem in the device and uses the full hardware and software capabilities of the device to securely log and report configuration changes within the device itself, without the need for external systems. JX-0004 at col. 2, lns. 21-30. Cheriton's invention solved the three problems with the prior art discussed above.

The '597 patent describes a communication device that itself contains a logging module that is separate from but coupled to one or more of the operative subsystems of the communication device. The device's logging module "determines a configuration of the subsystem 115, detects a change in the configuration of the subsystem 115, and indicates that the change has occurred." JX-0004 at col. 6, lns. 7-10. Inasmuch as the logging module logs each of these changes to the subsystem, the logging module can provide an indication whenever an attacker attempts to circumvent the security of the subsystem. *Id.* at col. 2, lns. 40-42. Unlike the prior art, the logging module of the '597 patent is contained within the device, coupled to its subsystems; it is not distributed across the device or other devices on the network.

Another aspect of the invention disclosed in the '597 patent secures the device's logging module by "substantially restricting" the ability to configure or disable the logging module remotely. JX-0004 at col. 3, lns. 56-62; col. 13, lns. 14-53; Fig. 8. This can be accomplished by structuring the device so that its logging module is not configurable over the device's network interface. The invention of the '597 patent also solves the shortcomings of prior art approaches because the device is able to broadcast configuration changes on the network, rather than being restricted to (for example) sending configuration changes to a single remote device. *Id.* at col. 11, lns. 45-51; col. 13, lns. 47-49; Fig. 8. This aspect of the device allows multiple remote external monitors to subscribe and unsubscribe to reports of the device's configuration changes generated by the device's logging module, without reconfiguring the device. This aspect of the device makes it more difficult for an attacker to mask a compromised device by attacking an external monitor.

3. The Asserted Claims

Cisco asserts independent claims 1, 39, and 71, and dependent claims 14, 15, 29, 63, 64,[3] 72, and 73 of the '597 patent.[4] The relevant claims read as follows:

1. An apparatus comprising:

a communications device comprising:

a subsystem; and

a logging module, coupled to said subsystem, and configured to detect a change to a configuration of said subsystem of said communications device, and communicate information regarding said change to said configuration of said subsystem of said communications device.

14. The communications device of claim 1, wherein

the subsystem is a communications interface.

15. The communications device of claim 14, wherein

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[3] Claims 63 and 64 depend from unasserted claim 40, which depends from asserted claim 39.

[4] Cisco relies on claims 1, 14, 15, 39, 71, and 72 of the '597 patent to argue satisfaction of the technical prong of the domestic industry requirement. *See* Compl. Br. at 31.

the logging module is further configured to restrict a change to a configuration of the logging module by the communications interface.

29. The communications device of claim 1, wherein

the logging module is configured to communicate the change to the configuration of the subsystem by broadcasting the change to the configuration of the subsystem.

39. A method comprising:

detecting a change in a configuration of a subsystem of a communications device wherein a logging module is coupled to said subsystem and said detecting is performed at the logging module; and

communicating information regarding the change comprises causing said logging module to communicate the change information.

40. The method of claim 39, further comprising:

determining the configuration.

63. The method of claim 40, wherein the communicating comprises:

broadcasting the information.

64. The method of claim 63, wherein the broadcasting is performed using the subsystem.

71. A communications device comprising:

a subsystem;

a processor, coupled to the subsystem;

computer readable medium coupled to the processor;

and computer code, encoded in the computer readable medium, configured to cause the processor to:

detect a change in a configuration of the subsystem; and

communicate information regarding the change.

72. The communications device of claim 71, wherein the computer code is further configured to cause the processor to:

determine the configuration.

73. The communications device of claim 72, wherein the computer code configured to cause the processor to communicate the information regarding the change is further configured to cause the processor to:

broadcast the information.

4. The '597 Products at Issue

a. Accused Arista Products

Cisco has accused Arista's 7010, 7048, 7050, 7050X, 7150, 7250X, 7280E, 7300, 7300X, and 7500E series network switches of infringing the '597 patent. CX-0001C (Wicker WS) at Q/A 83-261; *see* Compl. Br. at 31. It is argued that these communication devices comprise a subsystem and a logging module named Process Manager or "ProcMgr." CX-0001C (Wicker WS) at Q/A 83-261; *see* Compl. Br. at 31.

b. Cisco Domestic Industry Products

The Cisco '597 Domestic Industry Products ("the '597 DI Products") are the Catalyst 6500, Catalyst 6800, ASR 901, and Nexus 7000 product lines. CX-0001C (Wicker WS) at Q/A 262-316. It is argued that these devices comprise a subsystem and a logging module named On-Board Failure Logging or "OBFL." *Id.*

C. U.S. Patent Nos. Nos. 6,741,592 and 7,200,145

1. Overview of the Technology

A computer network is a system to enable communication among devices, typically computers that are connected to the network. A network is comprised of the hardware and software that allow devices to communicate with one another. CX-0003C (Jeffay WS) at Q/A 26. A common form of a computer network is a Local Area Network or "LAN." LANs typically span a small geographic area such as an office or a building, and are comprised of the hardware and software required to enable communication between devices attached to the network. CX-0003C (Jeffay WS) at Q/A 29. Common interconnection devices used to build LANs are devices such as "switches," "hubs," and "bridges." Devices that connect LANs to one another are called "routers." In addition, many networking devices function as both a switch and a router. CX-0003C (Jeffay WS) at Q/A 30.

The acronym "VLAN" stands for "Virtual Local Area Network" and can be conceptualized as a LAN within a LAN. A VLAN is a segment or a subset of a LAN and, like a LAN, is implemented using hardware and software. Networking devices that are members of the same VLAN can communicate with each other as if they are on the same LAN, but devices that are members of separate VLANs are isolated from each other at layer 2.[5] In general, VLANs are used to partition devices on a LAN into sub-LANs to create smaller, private, or secure networks without having to add more networking devices. CX-0003C (Jeffay WS) at Q/A 32.

2. Overview of the '592 and '145 Patents

The '592 patent is entitled, "Private VLANs," and issued on May 25, 2004. JX-0005 ('592 patent). The named inventors are Thomas J. Edsall, Marco Foschiano, Michael Fine, and Thomas Nosella. *Id.* The '145 patent is a continuation of the '592 patent, and the two patents (the "Private VLAN Patents") share the same specification.[6] *See id.*; JX-0006 ('145 patent). Both the '592 and '145 patents expire on May 22, 2020. JX-0005; JX-0006.

The Private VLAN Patents are directed toward mechanisms for separating users' traffic on a networking device using port and VLAN technologies. CX-0003C (Jeffay WS) at Q/A 34. As taught in the Private VLAN Patents, it was common at the time of the invention to separate

[5] References to numbered layers are with respect to the seven-layer OSI model of computer networking.

[6] Citations will be made to the specification of the '592 patent during discussions of the disclosures of and inventions claimed in both patents.

different users' packet traffic by assigning each user to a different subnetwork or "subnet" identified by a unique layer 3 address. JX-0005 ('592 patent) at col. 1, lns. 12-18. Several disadvantages of this practice are described in the Private VLAN Patents. For instance, only a limited number of subnets may be addressed by a particular network device, thereby restricting the number of users who can be served while having their traffic maintained separately. JX-0005 ('592 patent) at col. 1, lns. 19-22; col. 1, lns. 56-67; CX-0003C (Jeffay WS) at Q/A 44-45. Additionally, managing a large number of subnets within a networking device is burdensome. JX-0005 ('592 patent) at col. 1, lns. 56-67; CX-0003C (Jeffay WS) at Q/A 45.

The Private VLAN Patents purport to overcome these problems by providing special types of ports and VLANs for separating users' traffic on a single LAN, while allowing for greater scalability than was available using subnets. Specifically, the Private VLAN Patents introduce three new types of VLANs (referred to in some claims as a "primary VLAN," an "isolated VLAN," and a "community VLAN") that interact with three new types of ports (referred to in some claims as "promiscuous ports," "isolated ports," and "community ports"). CX-0003C (Jeffay WS) at Q/A 48. The Private VLAN Patents teach that these new VLANs and the corresponding port types work together to separate user traffic on a LAN, while making it easy to add and manage users new to the network.

In one particular embodiment shown in Figure 1 of the Private VLAN Patents, promiscuous ports receive packets from the Internet, and transmit them to user devices, such as servers, through isolated and community ports. CX-0003C (Jeffay WS) at Q/A 49; JX-0005 ('592 patent) at Fig. 1; col. 2, lns. 12-25; col. 3, ln. 62 – col. 4, ln. 7; col. 4, lns. 46-50. By contrast, isolated and community ports receive packets from the user devices and transmit them out to the Internet through promiscuous ports. CX-0003C (Jeffay WS) at Q/A 49; JX-0005 ('592 patent) at Fig. 1; col. 2, lns. 12-25; col. 4, lns. 52-64; col. 5, lns. 9-19. An isolated port can transfer packets to a promiscuous port, but cannot transfer packets to another isolated port. JX-0005 ('592 patent) at col. 2, lns. 20-26. Such a port is useful to isolate a single device on the network, such as one of the servers, so that no one else on the network can access that device. CX-0003C (Jeffay WS) at Q/A 49; JX-0005 ('592 patent) at col. 2, lns. 12-19. By contrast, a community port is a port that is part of a "community" of ports and can send packets to any other of the community ports in its community, but cannot directly exchange packets with ports that are not part of the community using layer 2 protocol. CX-0003C (Jeffay WS) at Q/A 49, Q/A 53; JX-0005 ('592 patent) at col. 2, lns. 20-26. This allows some users within a "community" to access devices on the network, while isolating other users. CX-0003C (Jeffay WS) at Q/A 49, Q/A 53.

In embodiments shown in Figures 2 and 3 of the Private VLAN Patents, a primary VLAN connects some or all of the promiscuous ports with some or all of the isolated and community ports. As such, packets received from the Internet at a promiscuous port can be transferred to isolated and community ports via a primary VLAN. To ensure the isolation between ports as described above, a primary VLAN is a one-way connection from a promiscuous port to isolated or community ports. Thus, for example, a packet received from a server at an isolated or promiscuous port cannot be transferred to any other port using a primary VLAN. CX-0003C (Jeffay WS) at Q/A 51; JX-0005 ('592 patent) at col. 2, lns. 27-36.

In contrast to a primary VLAN, an isolated VLAN is a VLAN that connects the isolated ports to some or all of the promiscuous ports. Like a primary VLAN, an isolated VLAN is also a one-way connection, but in this instance is directed from the isolated ports to the promiscuous ports; an isolated VLAN cannot transfer packets to other isolated ports or community ports.

Accordingly, a packet arriving at an isolated port from a server, for example, could not be directly transferred to a different server that is connected to another isolated port. This arrangement ensures isolation between the user traffic received at different isolated ports. CX-0003C (Jeffay WS) at Q/A 52; JX-0005 ('592 patent) at col. 2, lns. 37-45.

Finally, a community VLAN is used to connect the community ports to each other and to the promiscuous ports. As such, a community VLAN can receive packets from a community port and transfer them to other "community" ports as well as the promiscuous port. It cannot, however, send packets to an isolated port, and it is also a one-way connection to the promiscuous port. CX-0003C (Jeffay WS) at Q/A 53; JX-0005 ('592 patent) at col. 2, lns. 46-62. Community VLANs thus help users within a community to access shared devices, while still isolating the members of that community from other users.

3. The Asserted Claims

a. The '592 Patent

From the '592 patent, Cisco asserts independent claims 6, 20, and 21, as well as dependent claim 7.[7] The relevant claims read as follows:

> 6. A switch, comprising:
>
> a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network; and
>
> a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network, said selected isolated port exchanging packets with said promiscuous port through a

[7] Cisco relies on these same claims to prove satisfaction of the technical prong of the domestic industry requirement. *See* Compl. Br. at 266-74.

path inside said switch, and said isolated port not exchanging packets with another isolated port.

7. The switch of claim 6 further comprising:

a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network, each port of said community of ports exchanging packets through a path internal to said switch with said promiscuous port, and said each port of said community of ports exchanging packets with all ports of said plurality of community ports through a path within said switch, and said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch.

20. A switch implementing virtual local area networks (VLANs) in a computer network, comprising:

a first isolated port assigned to a user to receive said user's packet from an external circuit connected to said first isolated port; and

a selected promiscuous port to receive said packet through an isolated VLAN, said packet to be transferred to an external circuit connected to said promiscuous port, said isolated VLAN configured as a one way connection from all isolated ports to all promiscuous ports and also configured to prevent any other isolated port from receiving said user's packets from said isolated VLAN, said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports.

21. A switch implementing virtual local area networks (VLANs) in a computer network, comprising:

a plurality of community ports, including a first community port assigned to a user to receive said user's packet from an external circuit connected to said first community port; and

a plurality of promiscuous ports connected to external circuits to receive said packet through a community VLAN, all other community ports connected to said community VLAN also receiving said packet, but not any other ports of said switch, said community VLAN configured as a one way connection from all community ports in said community VLAN to all promiscuous ports, said all promiscuous ports also connected via a one way primary VLAN to all community ports.

b. The '145 Patent

From the '145 patent, Cisco asserts independent claims 5, 7, 45, and 46.[8] The relevant claims read as follows:

> 5. A router, comprising:
>
> a port connected to a shared network;
>
> a plurality of user ports;
>
> a first VLAN from the port connected to the shared network to the plurality of user ports, the first VLAN to receive packets from the shared network and transferring them to a designated user port, the first VLAN to reject packets from the user ports;
>
> a second VLAN from the plurality of user ports, the second VLAN to receive packets from the user ports and transferring them to the port connected to the shared network, the second VLAN to prevent transfer of packets from one of the user ports to other user ports, and the second VLAN also to reject packets from the shared network, in order to separate packet traffic of different users.
>
> 7. A router, comprising:
>
> one or more promiscuous ports;
>
> one or more isolated ports;
>
> one or more community ports;
>
> a primary VLAN, the primary VLAN to receive packets from outside of the router through the one or more promiscuous ports and to transfer the packets to a selected one of the one or more isolated ports and to transfer the packets to the one or more community ports, the primary VLAN to reject packets from the one or more isolated ports and to reject packets from the one or more community ports;
>
> an isolated VLAN, the isolated VLAN to receive packets from outside of the router through an isolated port of the one or more isolated ports and to transfer the packets to the one or more promiscuous ports, the isolated VLAN to prevent transfer of the packets from the isolated port

[8] Cisco relies on these same claims to prove satisfaction of the technical prong of the domestic industry requirement. *See* Compl. Br. at 274-80.

to another isolated port of the one or more isolated ports, and the isolated VLAN to prevent transfer of the packets from the isolated port to the one or more community ports, and the isolated VLAN to reject packets from the one or more promiscuous ports; and

a community VLAN, the community VLAN to receive packets from outside of the router at a community port of the one or more community ports and to transfer the packets to the one or more promiscuous ports and to transfer the packets to any other community ports, the community VLAN to prevent transfer of packets to the one or more isolated ports, the community VLAN to reject packets from the one or more promiscuous ports.

45. A computer readable medium containing executable program instructions for operating a router, the executable program instructions comprising program instructions configured to:

establish a first VLAN from a port connected to a shared network to a plurality of user ports, the first VLAN to receive packets from the shared network and to transfer them to one or more of the user ports, the first VLAN to reject any packets received from the user ports;

establish a second VLAN from the plurality of user ports, the second VLAN to receive packets from the user ports and to transfer them to the port connected to the shared network, the second VLAN to prevent transfer of packets from one of the user ports to other user ports, and the second VLAN also to reject packets from the shared network, to thereby separate packet traffic of different users.

46. A computer readable medium containing executable program instructions for operating a router, the executable program instructions comprising program instructions configured to:

establish a primary VLAN, the primary VLAN to receive packets from outside of the router through the one or more promiscuous ports and to transfer the packets to one or more community ports, the primary VLAN to reject packets received from the one or more community ports; and

establish a community VLAN, the community VLAN to receive packets from outside the router on a community port of the one or more community ports and to transfer the packets to the one or more promiscuous ports and to transfer the packets to any other community ports of the one or more community ports, the community VLAN rejecting packets received from the one or more promiscuous ports.

4. The Private VLAN Products at Issue

a. Accused Arista Products

Cisco contends that Arista's 7010, 7050, 7050X, 7150, 7250X, 7300, and 7300X series network switches that run Arista's EOS software, which in turn supports the private VLAN feature, infringe the asserted claims of the Private VLAN Patents (the "Accused Private VLAN Products"). CX-0003C (Jeffay WS) at Q/A 132-133.

b. Cisco Domestic Industry Products

To show satisfaction of the technical prong of the domestic industry requirement with respect to the Private VLAN Patents, Cisco relies on Cisco's Catalyst 4500 and Catalyst 6500 series switches, the CBS 3110-40 series switches, the Industrial Ethernet 3000 series switches, the Connected Grid 2520 series switches, and the Nexus 3000, Nexus 5000, Nexus 6000, Nexus 7000, and Nexus 9000 series switches with the private VLAN feature (the "Cisco Private VLAN DI Products"). CX-0003C (Jeffay WS) at Q/A 441-442.

D. U.S. Patent No. 7,290,164

1. Overview of the Technology

The '164 patent relates to the configuration and re-configuration of intermediate network devices, such as routers and switches. A network device, which serves to interconnect end-user devices on a computer network, has one or more network interfaces, which is the hardware onto which links connect. *See, e.g.*, CX-0008C (Bhattacharjee WS) at Q/A 34. Configuring a network device requires providing instructions with operational parameters to each network interface on the device. *See, e.g.*, *id.* at Q/A 36. A device may include configuration files referenced by the operating system. *Id.* Configuring a device would also include modifying these files. *Id.* Network administrators can implement high-level network policy by specifying such instructions. *Id.*

It is common for network devices to have what is known as a Command Line Interface ("CLI") for receiving configuration instructions. *See, e.g.*, CX-0008C (Bhattacharjee WS) at Q/A 37. The device will accept configuration commands, which are strings of text, through the CLI. *Id.* These CLI commands can be input directly, for example by a network administrator using a terminal, or they may be stored in and executed from a file. *Id.*

For example, configuration commands can be used to configure an interface with a network address, such as an IP address. *See, e.g.*, CX-0008C (Bhattacharjee WS) at Q/A 38. Similarly, the device can be given instructions to select which protocols the device must run on a network. *See, e.g.*, *id.* at Q/A 39. These configurations can enable the exchange of routing or forwarding information to facilitate communication on the network. *Id.*

In the context of the '164 patent, provisioning a network device means providing it with configurations for hardware and software to make the device operational. JX-0003 ('164 patent) at col. 1, lns. 32-45; col. 2, lns. 6-12. Once a device has been deployed and its wired links connected, it must be provided with a configuration for it to be operational. CX-0008C (Bhattacharjee WS) at Q/A 43.

The '164 patent addresses the scenario in which a network device has a configuration, but that configuration is lost or modified in a way that prevents the device and the network management system from communicating. Prior to the patent, there was no way to recover that connectivity in an automatic manner. JX-0003 ('164 patent) at col. 1, lns. 46–54. Typically, a user would have to manually enter configuration commands or a technician would need to travel to the customer's premises to manually reconfigure the device. *Id.*

The '164 patent specification discusses a prior art attempt to solve the problem described above called "rollback." Under the rollback mechanism, the current configuration of the device is periodically saved, and the user can roll back to a previous configuration if needed. JX-0003 ('164 patent) at col. 1, ln. 55 – col. 2, ln. 5. Nevertheless, the configuration of a network device embeds information about security, topology, and policy, all of which can change over time. Therefore, the '164 patent explains that "what worked yesterday may not work tomorrow." *Id.* at col. 1, ln. 58 – col. 2, ln. 5. The '164 patent also teaches that rolling back a network configuration may create security vulnerabilities or violate network privacy policies. Therefore, rollback is extremely dangerous, and automatic rollbacks are not advised. *See* CX-0008C (Bhattacharjee WS) at Q/A 47.

2. Overview of the '164 Patent

Asserted U.S. Patent No. 7,290,164 ("the '164 patent") is titled, "Method of Reverting to a Recovery Configuration in Response to Device Faults." JX-0003 ('164 patent). The '164 patent issued on October 30, 2007, and the named inventors are Andrew G. Harvey, John Ng, and Gilbert R. Woodman, III. *Id.*

The inventors conceived a mechanism for the automatic re-provisioning, or reconfiguration, of a network device that has a lost, misconfigured, or corrupted configuration. *See, e.g.*, JX-0003 ('164 patent) at col. 2, lns. 6-9; col. 3, lns. 59-64. The '164 patent teaches a network device that automatically reverts to a recovery configuration stored on the device upon detecting a loss of connectivity resulting from a configuration change. The recovery configuration enables the device to connect to a configuration manager on the network to download a new configuration. *See, e.g.*, *id.* at col. 3, lns. 46-57. The configuration manager is an entity coupled to the network and comprising configuration information which may be exchanged with a network device. *Id.* at col. 5, lns. 25-29; Fig. 1.

The scenario envisioned by exemplary claim 1 is one in which the configuration on the network device is changed based on configuration instructions such that the network device loses connectivity with the network. For example, and with reference to Figure 1 of the '164 patent reproduced below, a network administrator at a computer connected to a network (Network A [item 101]) issues configuration instructions to a network device (CPE A [item 110]) in order to change the device's current configuration (e.g., Running Config [item 110B]) to a new configuration:

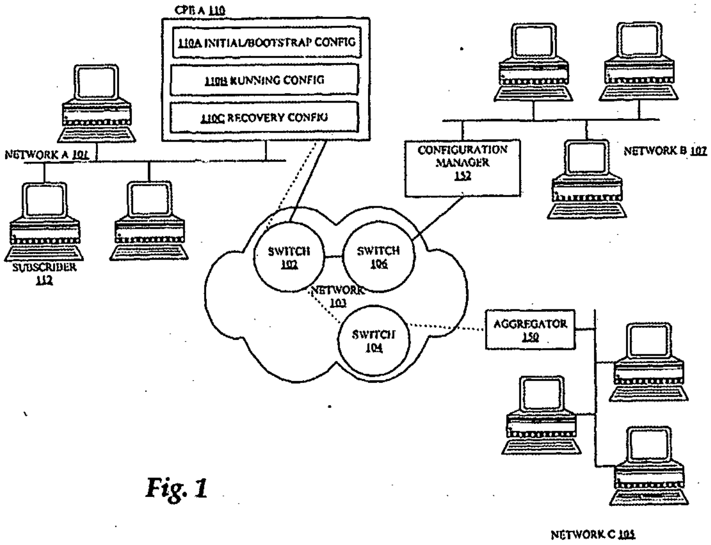
CPE A 110
110A INITIAL/BOOTSTRAP CONFIG
110B RUNNING CONFIG
110C RECOVERY CONFIG
NETWORK A 101
SUBSCRIBER 112
SWITCH 102
SWITCH 106
NETWORK 103
SWITCH 104
CONFIGURATION MANAGER 152
NETWORK B 107
AGGREGATOR 150
NETWORK C 105

Fig. 1

As recited in claim 1, the network device will detect a loss of connectivity between the device and a network (*e.g.*, Networks A [item 101], B [item 107], or C [item 107]) resulting from the configuration change and revert to a recovery configuration ("Recovery Config" [item 110C]).

The '164 patent requires that the recovery configuration be stored in persistent storage in association with manufacturing the device. JX-0003 ('164 patent) at claims 1, 18. Such storage is persistent and can be used beyond just initial provisioning. *Id.* at col 1, lns. 46-54; col. 3, lns. 49-51; col. 7, ln.62 – col. 8, ln. 6; claim 1. Manufacturing the device in this way is one aspect that distinguishes the '164 invention from the rollback prior art, inasmuch as rollback configurations are created post-install. *Id.* at col. 1, ln. 55 – col. 2, ln. 5. Additionally, the '164 patent teaches that the recovery configuration may serve a dual-purpose as a boot configuration loaded during manufacture to enable automatic provisioning of a newly installed device. *Id.* at col. 3, lns. 59-61; col. 1, lns. 32-45.

3. The Asserted Claims

Cisco asserts independent claims 1 and 18, as well as dependent claims 5, 6, and 9 of the '164 patent.[9] The relevant claims read as follows:

> 1. A method of reverting to a recovery configuration in response to faults of a network device, the method comprising the computer-implemented steps of:
>
> receiving configuration instructions;
>
> changing a current configuration to a new configuration based upon the configuration instructions;
>
> detecting a loss of connectivity between the device and a network resulting from the configuration change; and
>
> recovering from the loss of connectivity by reverting to a recovery configuration, wherein the recovery configuration is stored in a persistent storage of the device in association with manufacturing the device, wherein the recovering step further comprises:
>
> retrieving a recovery configuration;
>
> making the recovery configuration the current configuration; and
>
> establishing connectivity to a configuration manager using the recovery configuration.

[9] Cisco refers to claims 1, 5, 9, and 18 of the '164 patent to argue satisfaction of the technical prong of the domestic industry requirement. *See* Compl. Br. at 41.

5. A method as recited in claim 1, wherein the step of recovering from the loss of connectivity by reverting to a recovery configuration further comprises the steps of:

receiving from the configuration manager a network level configuration; and

replacing the current configuration with the network level configuration.

6. A method as recited in claim 1, wherein the recovery configuration is a boot configuration and wherein establishing connectivity to a configuration manager using the recovery configuration comprises:

establishing connectivity with the configuration manager as a new device.

9. A method as recited in claim 1, wherein retrieving the recovery configuration comprises:

obtaining a configuration for a state enabling the device to establish connectivity to the configuration manager.

18. A computer-readable medium carrying one or more sequences of instructions for reverting to a recovery configuration in response to faults of a network device, which instructions, when executed by one or more processors, cause the one or more processors to carry out the steps of:

receiving configuration instructions;

changing the current configuration to a new configuration based upon the configuration instructions;

detecting a loss of connectivity between the device and a network resulting from the configuration change;

recovering from the loss of connectivity by reverting to a recovery configuration

wherein the recovery configuration is stored in a persistent storage of the device in association with manufacturing the device, wherein the recovering step further comprises:

retrieving the recovery configuration;

making the recovery configuration the current configuration; and establishing connectivity to a configuration manager using the recovery configuration.

4. The '164 Products at Issue

a. Accused Arista Products

Cisco contends that Arista's 7010, 7048, 7050, 7050X, 7150, 7250X, 7300, 7300X, and 7500E series network switches running Arista's EOS with the Zero Touch Provisioning feature infringe the asserted claims of the '164 patent. CX-0008C (Bhattacharjee WS) at Q/A 87-88.

b. Cisco Domestic Industry Products

Cisco contends that the Nexus 3000, Nexus 5000, Nexus 6000, Nexus 7000 and Nexus 9000 series switches with the Power-on Auto-Provisioning ("PoAP") feature are domestic industry products for the '164 patent. CX-0008C (Bhattacharjee WS) at Q/A 89.

IV. General Principles of Law

A. Claim Construction

Claim construction begins with the plain language of the claim.[10] Claims should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent.[11] *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006).

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[10] Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int'l Trade Comm'n*, 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. American Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

[11] Factors that may be considered when determining the level of ordinary skill in the art include: "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984).

In some instances, claim terms do not have particular meaning in a field of art, and claim construction involves little more than the application of the widely accepted meaning of commonly understood words. *Phillips*, 415 F.3d at 1314. "In such circumstances, general purpose dictionaries may be helpful." *Id.*

In many cases, claim terms have a specialized meaning, and it is necessary to determine what a person of skill in the art would have understood the disputed claim language to mean. "Because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the court looks to 'those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean.'" *Id.* (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)). The public sources identified in *Phillips* include "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Id.*

In cases in which the meaning of a claim term is uncertain, the specification usually is the best guide to the meaning of the term. *Id.* at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996). The specification is, however, always highly relevant to the claim construction analysis, and is usually dispositive. *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Moreover, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Id.* at 1316.

Claims are not necessarily, and are not usually, limited in scope to the preferred embodiment. *RF Delaware, Inc. v. Pacific Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir. 2003); *Decisioning.com, Inc. v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. 2008) ("[The] description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims."). Nevertheless, claim constructions that exclude the preferred embodiment are "rarely, if ever, correct and require highly persuasive evidentiary support." *Vitronics*, 90 F.3d at 1583. Such a conclusion can be mandated in rare instances by clear intrinsic evidence, such as unambiguous claim language or a clear disclaimer by the patentees during patent prosecution. *Elekta Instrument S.A. v. O.U.R. Sci. Int'l, Inc.*, 214 F.3d 1302, 1308 (Fed. Cir. 2000); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319 (Fed. Cir. 2002).

If the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence may be considered. Extrinsic evidence consists of all evidence external to the patent and the prosecution history, and includes inventor testimony, expert testimony, and learned treatises. *Phillips*, 415 F.3d at 1317. Inventor testimony can be useful to shed light on the relevant art. In evaluating expert testimony, a court should discount any expert testimony that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent. *Id.* at 1318. Extrinsic evidence may be considered if a court deems it helpful in determining the true meaning of language used in the patent claims. *Id.*

B. Infringement

1. Direct Infringement

Under 35 U.S.C. §271(a), direct infringement consists of making, using, offering to sell, or selling a patented invention without consent of the patent owner. The complainant in a section 337 investigation bears the burden of proving infringement of the asserted patent claims by a "preponderance of the evidence." *Certain Flooring Products*, Inv. No. 337-TA-443, Comm'n Notice of Final Determination of No Violation of Section 337, 2002 WL 448690, at *59, (Mar. 22, 2002); *Enercon GmbH v. Int'l Trade Comm'n*, 151 F.3d 1376 (Fed. Cir. 1998).

Literal infringement of a claim occurs when every limitation recited in the claim appears in the accused device, *i.e.*, when the properly construed claim reads on the accused device exactly.[12] *Amhil Enters., Ltd. v. Wawa, Inc.*, 81 F.3d 1554, 1562 (Fed. Cir. 1996); *Southwall Tech. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed Cir. 1995).

If the accused product does not literally infringe the patent claim, infringement might be found under the doctrine of equivalents. "Under this doctrine, a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 21 (1997) (citing *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605,

[12] Each patent claim element or limitation is considered material and essential. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). If an accused device lacks a limitation of an independent claim, the device cannot infringe a dependent claim. *See Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1552 n.9 (Fed. Cir. 1989).

609 (1950)). "The determination of equivalence should be applied as an objective inquiry on an element-by-element basis."[13] *Id.* at 40.

"An element in the accused product is equivalent to a claim limitation if the differences between the two are insubstantial. The analysis focuses on whether the element in the accused device 'performs substantially the same function in substantially the same way to obtain the same result' as the claim limitation." *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374, 1382 (Fed. Cir. 2005) (quoting *Graver Tank*, 339 U.S. at 608); *accord Absolute Software*, 659 F.3d at 1139-40.[14]

Prosecution history estoppel can prevent a patentee from relying on the doctrine of equivalents when the patentee relinquished subject matter during the prosecution of the patent, either by amendment or argument. *AquaTex*, 419 F.3d at 1382. In particular, "[t]he doctrine of prosecution history estoppel limits the doctrine of equivalents when an applicant makes a narrowing amendment for purposes of patentability, or clearly and unmistakably surrenders subject matter by arguments made to an examiner." *Id.* (quoting *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1344 (Fed. Cir. 2005)).

2. Induced Infringement

With respect to induced infringement, section 271(b) of the Patent Act provides: "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C.

[13] "Infringement, whether literal or under the doctrine of equivalents, is a question of fact." *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1130 (Fed. Cir. 2011).

[14] "The known interchangeability of substitutes for an element of a patent is one of the express objective factors noted by *Graver Tank* as bearing upon whether the accused device is substantially the same as the patented invention. Independent experimentation by the alleged infringer would not always reflect upon the objective question whether a person skilled in the art would have known of the interchangeability between two elements, but in many cases it would likely be probative of such knowledge." *Warner-Jenkinson*, 520 U.S. at 36.

§ 271(b). "To prevail on a claim of induced infringement, in addition to inducement by the defendant, the patentee must also show that the asserted patent was directly infringed." *Epcon Gas Sys. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1033 (Fed. Cir. 2002). Further, "[s]ection 271(b) covers active inducement of infringement, which typically includes acts that intentionally cause, urge, encourage, or aid another to directly infringe a patent." *Arris Group v. British Telecomms. PLC*, 639 F.3d 1368, 1379 n.13 (Fed. Cir. 2011). The Supreme Court has held that "induced infringement under § 271(b) requires knowledge that the induced acts constitute patent infringement." *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 131 S. Ct. 2060, 2068 (2011). The Court further held: "[g]iven the long history of willful blindness[ ] and its wide acceptance in the Federal Judiciary, we can see no reason why the doctrine should not apply in civil lawsuits for induced patent infringement under 35 U.S.C. § 271(b)." 131 S. Ct. at 2060 (footnote omitted).

3. Contributory Infringement

As for contributory infringement, section 271(c) of the Patent Act provides: "Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer." 35 U.S.C. § 271(c).

Section 271(c) "covers both contributory infringement of system claims and method claims." *Arris*, 639 F.3d at 1376 (footnotes omitted). To hold a component supplier liable for contributory infringement, a patent holder must show, *inter alia*, that (a) the supplier's product was used to commit acts of direct infringement; (b) the product's use constituted a material part of the invention; (c) the supplier knew its product was especially made or especially adapted for use in an infringement" of the patent; and (d) the product is not a staple article or commodity of commerce suitable for substantial noninfringing use. *Id.*

C. Validity

1. Anticipation

Anticipation under 35 U.S.C. § 102 is a question of fact. *z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347 (Fed. Cir. 2007). Section 102 provides that, depending on the circumstances, a claimed invention may be anticipated by variety of prior art, including publications, earlier-sold products, and patents. *See* 35 U.S.C. § 102 (*e.g.*, section 102(b) provides that one is not entitled to a patent if the claimed invention "was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States").

The general law of anticipation may be summarized, as follows:

> A reference is anticipatory under § 102(b) when it satisfies particular requirements. First, the reference must disclose each and every element of the claimed invention, whether it does so explicitly or inherently. *Eli Lilly & Co. v. Zenith Goldline Pharms., Inc.*, 471 F.3d 1369, 1375 (Fed.Cir.2006). While those elements must be "arranged or combined in the same way as in the claim," *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed.Cir.2008), the reference need not satisfy an *ipsissimis verbis* test, *In re Bond*, 910 F.2d 831, 832-33 (Fed. Cir. 1990). Second, the reference must "enable one of ordinary skill in the art to make the invention without undue experimentation." *Impax Labs., Inc. v. Aventis Pharms. Inc.*, 545 F.3d 1312, 1314 (Fed.Cir.2008); *see In re LeGrice*, 49 C.C.P.A. 1124, 301 F.2d 929, 940-44 (1962). As long as the reference discloses all of the claim limitations and enables the "subject matter that falls within the scope of the claims at issue," the reference anticipates -- no "actual creation or reduction to practice" is required. *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1380-81 (Fed.Cir.2003); *see In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985).

> This is so despite the fact that the description provided in the anticipating reference might not otherwise entitle its author to a patent. *See Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1562 (Fed. Cir. 1991) (discussing the "distinction between a written description adequate to support a claim under § 112 and a written description sufficient to anticipate its subject matter under § 102(b)").

In re Gleave, 560 F.3d 1331, 1334 (Fed. Cir. 2009).

2. Obviousness

Under section 103 of the Patent Act, a patent claim is invalid "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."[15] 35 U.S.C. § 103. While the ultimate determination of whether an invention would have been obvious is a legal conclusion, it is based on "underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness." *Eli Lilly and Co. v. Teva Pharmaceuticals USA, Inc.*, 619 F.3d 1329 (Fed. Cir. 2010).

The objective evidence, also known as "secondary considerations," includes commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006). "[E]vidence arising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). Secondary considerations, such as commercial success, will

[15] The standard for determining whether a patent or publication is prior art under section 103 is the same as under 35 U.S.C. § 102, which is a legal question. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987).

not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness).

"One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR*, 550 U.S. at 419-20. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.*

Specific teachings, suggestions, or motivations to combine prior art may provide helpful insights into the state of the art at the time of the alleged invention. *Id.* at 420. Nevertheless, "an obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way." *Id.* "Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* A "person of ordinary skill is also a person of ordinary creativity." *Id.* at 421.

Nevertheless, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 416 (a combination of elements must do more than yield a predictable result; combining elements that work together in an unexpected and fruitful manner would not have been obvious).[16]

3. Patentable Subject Matter

A patent may be obtained for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. Section 101 nevertheless "contains an important implicit exception" for abstract ideas, which reflects "the longstanding rule that '[a]n idea of itself is not patentable.'" *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014) (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Inasmuch as "all inventions" rest upon abstract ideas at some level, tribunals must "tread carefully in construing this exclusionary principle lest it swallow all of patent law." *Alice*, 134 S. Ct. at 2354 (quotation marks omitted); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012) (warning "too broad an interpretation of this exclusionary principle could eviscerate patent law"). It therefore is important to "distinguish between patents that claim the 'buildin[g] block[s]' of human ingenuity and those that integrate the building blocks into something more." *Alice*, 134 S. Ct. at 2354 (quoting *Mayo*, 132 S. Ct. at 1303) (modifications in original).

The Supreme Court has set forth a two-part framework for analyzing Section 101 eligibility. *See Alice*, 134 S. Ct. at 2355. A court first determines whether the asserted claims involve an underlying abstract idea. *Id.* If so, then it then determines whether the claims "contain[] an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application." *Id.* at 2357 (quoting *Mayo*, 132 S. Ct. at 1294, 1298). This can be

[16] Further, "when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 52 (1966)).

shown by "solv[ing] a technological problem in 'conventional industry practice,'" "improv[ing] an existing technological process," or "improv[ing] the functioning of the computer itself." *Id.* at 2358-59 (quoting *Diamond v. Diehr*, 450 U.S. 175, 178 (1981)). Inasmuch as a patent is presumed valid, Arista must demonstrate that a patent fails both steps of the *Alice* framework by clear and convincing evidence. *See* 35 U.S.C. § 282; *Microsoft Corp. v. i4i Ltd. P'Ship*, 131 S. Ct. 2238, 2242 (2011); *StoneEagle Servs., Inc. v. Play-Plus Solutions, Inc.*, 2015 WL 4042097, *4 (M.D. Fla. July 1, 2015); *Trading Techs. Int'l, Inc. v. CQG, Inc.*, 2015 WL 774655, *3 (N.D. Ill. Feb. 24, 2015); *see, e.g.*, *Certain Audiovisual Components*, Inv. No. 337-TA-837, 2013 WL 4406820, *45 (July 18, 2013).

4. Written Description

The issue of whether a patent is invalid for failure to meet the written description requirement of 35 U.S.C. § 112, ¶ 1 is a question of fact. *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc.*, 670 F.3d 1171, 1188 (Fed. Cir. 2012). A patent's written description must clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed. The test for sufficiency of a written description is "whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* (quoting *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*)).

5. Enablement

A patent's specification must "enable a person of ordinary skill in the art to make and use the invention." 35 U.S.C. § 112 ¶ 1 (2006). This requirement is met when, at the time of filing the application, one skilled in the art, having read the specification, could practice the invention without "undue experimentation." *Genentech Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365

(Fed. Cir. 1997) (quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993)). Enablement is a question of law. *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1576 (Fed. Cir. 1984); *Streck, Inc. v. Research & Diagnostic Sys.*, 665 F.3d 1269, 1288 (Fed. Cir. 2012).

When determining whether or not the amount of experimentation required to make and use the claimed invention is undue, courts consider the *Wands* factors: the quantity of experimentation necessary, the amount of direction or guidance presented in the specification, the presence of working samples, the nature of the invention, the state of the prior art, the relative skill of those in the art, the predictability or unpredictability of the art, and the breadth of the claims. *In re Wands*, 858 F.2d 731, 735 (Fed. Cir. 1988).

6. Indefiniteness

The definiteness requirement of 35 U.S.C. § 112 ensures that the patent claims particularly point out and distinctly claim the subject matter that the patentee regards to be the invention. *See* 35 U.S.C. § 112, ¶ 2; *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366 (Fed. Cir. 2004). If a claim's legal scope is not clear enough so that a person of ordinary skill in the art could determine whether or not a particular product infringes, the claim is indefinite, and is, therefore, invalid. *Geneva Pharm., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003).[17]

Thus, it has been found that:

> When a proposed construction requires that an artisan make a separate infringement determination for every set of circumstances in which the composition may be used, and when such determinations are likely to result in differing outcomes (sometimes infringing and sometimes not), that construction is likely to be indefinite.

[17] Indefiniteness is a question of law. *IGT v. Bally Gaming Int'l, Inc.*, 659 F.3d 1109 (Fed. Cir. 2011).

Halliburton Energy Servs. v. M-I LLC, 514 F.3d 1244, 1255 (Fed. Cir. 2008).

The Supreme Court recently addressed the issue of indefiniteness, and stated that a finding of indefiniteness should not be found if the claims, "viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014).

D. Assignor Estoppel

"Assignor estoppel is an equitable doctrine that prevents one who has assigned the rights to a patent . . . from later contending that what was assigned is a nullity." *Diamond Scientific Co. v. Ambico, Inc.*, 848 F.2d 1220, 1224 (Fed. Cir. 1988). One who assigns patent rights is presumed to have made an "implicit representation" that the rights assigned "are not worthless." *Mentor Graphics Corp. v. Quickturn Design Sys., Inc.*, 150 F.3d 1374, 1377 (Fed. Cir. 1998) (quoting *Diamond*). Thus, an assignor is estopped from raising defenses asserting, in effect, "what [it] has sold as a patent was not a patent." *Diamond*, 848 F.2d at 1224. "The estoppel historically has applied to invalidity challenges based on 'novelty, utility, patentable invention, anticipatory matter, and the state of the art.'" *Id.* (quoting *Babcock v. Clarkson*, 63 F. 607, 609 (1st Cir. 1894)). The bar can also extend to the inequitable conduct equitable defense. *See Shamrock Techs., Inc. v. Med. Sterilization, Inc.*, 903 F.2d 789, 794 (Fed. Cir. 1990).

Assignor estoppel applies to assignors, and to "other parties in privity with the assignor such as a corporation founded by the assignor." *Diamond*, 848 F.2d at 1224. Privity depends on a balancing of equities based on the strength of the relationship between the assignor and the other party. *Shamrock*, 903 F.2d at 793. Privity does not require that the assignor designed or worked on the infringing technology. *Mentor Graphics*, 150 F.3d at 1379 (finding privity between two companies, even though the assignor company did not develop the accused product). If such facts are present they favor a finding of privity, but they are not required. "What is significant is whether the ultimate infringer availed itself of the inventor's 'knowledge and assistance.'" *Intel Corp. v. U.S. Int'l Trade Comm'n*, 946 F.2d 821, 839 (Fed. Cir. 1991).

E. Equitable Defenses

1. Equitable Estoppel

To establish the affirmative defense of estoppel, an alleged infringer must demonstrate: "(1) misleading conduct, which may include not only statements and action but silence and inaction, leading another to reasonably infer that rights will not be asserted against it; (2) reliance upon this conduct; and (3) due to this reliance, material prejudice if the delayed assertion of such rights is permitted." *Certain Bearings and Packaging Thereof*, Inv. No. 337-TA-487, Initial Determination at 28 (April 10, 2003) (internal citations omitted). Notably, "[r]eliance is not the same as prejudice or harm, although frequently confused . . . [t]o show reliance, the infringer must have had a relationship or communication with the plaintiff which lulls the infringer into a sense of security." *Id.* (quoting *A.C. Aukerman Co. v. R. L. Chaides Constr. Co.*, 960 F.2d 1020, 1033 (Fed. Cir. 1992) (*en banc*)). Material prejudice may be established by a showing of "change of economic position or loss of evidence." *Aukerman*, 960 F.2d at 1033. Additionally, egregious conduct on the part of the alleged infringer must also be considered. *Bearings*, Initial Determination at 28.

It is well-established that all relief, including prospective relief, may be barred by equitable estoppel. *Aukerman*, 960 F.2d at 1041. Nevertheless, application of the doctrine is given to the sound discretion of the trial judge. *Id.* at 1028.

2. Laches

Section 337(c) provides that "[a]ll legal and equitable defenses may be presented in all cases." 19 U.S.C. § 1337(c). Pursuant to this provision, legal and equitable defenses to infringement cognizable in federal district courts may generally be asserted before the Commission. *See Lannom Mfg. Co. v. U.S. Int'l Trade Comm'n*, 799 F.2d 1572, 1576-79 (Fed. Cir. 1986).

In *Aukerman v. Chaides*, 960 F.2d 1020 (Fed. Cir. 1992) (*en banc*), the Federal Circuit held that the equitable defense of laches applied only to past damages, and could not bar prospective relief. *See Aukerman*, 960 F.2d at 1041 ("[L]aches bars relief on patentee's claim only with respect to damages accrued prior to suit."). Under this authority, the Commission had previously determined that laches is not available as a defense before the Commission. *See Certain Personal Watercraft and Components Thereof*, Inv. No. 337-TA-452, Initial Determination, Order No. 54 at 2 (September 19, 2001) (EDIS Doc. No. 61574) (unreviewed, EDIS Doc. No. 61619); *Certain EPROM, EEPROM, Flash Memory, and Flash Memory Microcontroller Semiconductor Devices*, Inv. 337-TA-395, Supplemental Views of Commission Bragg at n.65, 1998 WL 35428257, at *28 (Oct. 1998) ("The facts of this case suggest an attempt . . . to take what is essentially a laches defense and bootstrap it into prospective relief, which *Aukerman* holds to be impossible.").

The Federal Circuit recently issued an *en banc* decision rejecting *Aukerman*'s "bright line rule" regarding laches and prospective relief. *See SCA Hygiene Products Aktiebolag SCA Personal Care, Inc. v. First Quality Baby Products, LLC*, 807 F.3d 1311 (Fed. Cir. 2015) (*en banc*). The *SCA Hygiene* opinion explained that the court convened *en banc* to resolve whether, "in light of the Supreme Court's recent decision in *Petrella v. Metro-Goldwyn-Mayer, Inc.*, 134

S. Ct. 1962 (2014), laches remains a defense to legal relief in a patent infringement suit." *Id.* at 1315. Although *Petrella* concerned a copyright infringement cause of action and one of the issues concerned a delay in the assertion of that cause of action, the *SCA Hygiene* court stated: "Still, Petrella clearly casts doubt on several aspects of *Aukerman*." *Id.* at 1321. The *SCA Hygiene* court held that laches considerations can be applied in assessing prospective relief, including with respect to injunctions and, in "extraordinary circumstances," to ongoing royalties. *See id.* at 1315 ("We emphasize that equitable principles apply whenever an accused infringer seeks to use laches to bar ongoing relief.").

While it appears to be a matter of first impression, the Federal Circuit's *SCA Hygiene* decision may provide a basis under some circumstances to assert laches before the Commission.[18]

In order to prevail in a laches defense in the event that such a defense is appropriate under the circumstances of this investigation, Arista must prove that (1) Cisco delayed in bringing an infringement lawsuit for an "unreasonable and inexcusable" length of time from when it knew or reasonably should have known of its infringement claim against the accused infringer, and (2) the delay caused "material prejudice" or injury (economic or evidentiary) to the defendant. *See Aukerman*, 960 F.2d at 1028. A presumption of laches may apply only where the delay in bringing suit is more than 6 years. *Id.* at 1035. This period begins with a patentee's

[18] The *SCA Hygiene* court reasoned that although *Aukerman* held that laches could not bar prospective relief, "[r]eexamination of that rule is necessary in light of *Petrella* and the Supreme Court's decision in *eBay v. MerchExchange, L.L.C.*, 547 U.S. 388 (2006)." *SCA Hygiene*, 807 F.3d at 1331. However, to the extent the *SCA Hygiene* court's rationale for overruling the holding in *Aukerman* is based in part on *eBay*, the reasoning based on *eBay* should not apply to the Commission. *See, e.g., Spansion, Inc. v. Int'l Trade Comm'n*, 629 F.3d 1331, 1359 (Fed. Cir. 2010) ("Given the different statutory underpinnings for relief before the Commission in Section 337 actions and before the district courts in suits for patent infringement, this court holds that *eBay* does not apply to Commission remedy determinations under Section 337.").

actual or constructive knowledge of defendant's infringement and counts forward. *Id.* at 1035-36.

3. Implied License

An implied license may arise "where the circumstances plainly indicate that the grant of a license should be inferred." *Bandag, Inc. v. Al Bolser's Tire Stores, Inc.*, 750 F.2d 903, 925 (Fed. Cir. 1984) (*citing Hunt v. Armour & Co.*, 185 F.2d 722, 729 (7th Cir. 1950)). An implied license "signifies a patentee's waiver of the statutory right to exclude others from making, using, selling, offering to sell, or importing the patented invention," and may be established by: (1) equitable estoppel, (2) acquiescence, (3) conduct, or (4) legal estoppel. *Wang Lab. v. Mitsubishi Elecs. Am.*, 103 F.3d 1571, 1580-81 (Fed. Cir. 1997).

4. Patent Misuse

"Patent misuse is an equitable defense to patent infringement." *U.S. Philips Corp. v. Int'l Trade Comm'n*, 424 F.3d 1179, 1184 (Fed. Cir. 2005). A finding of misuse renders a patent temporarily unenforceable until the misuse has been purged. *Qualcomm Inc. v. Broadcom Corp.*, 548 F.3d 1004, 1025 (Fed. Cir. 2008) (quoting *B. Braun Medical, Inc. v. Abbott Labs.*, 124 F.3d 1419, 1427 (Fed. Cir. 1997)). "The doctrine of patent misuse is [] grounded in the policy-based desire to 'prevent a patentee from using the patent to obtain market benefit beyond that which inheres in the statutory patent right.'" *Princo Corp. v. Int'l Trade Comm'n,* 616 F.3d 1318, 1328 (Fed. Cir. 2010) (*en banc*) (quoting *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 704 (Fed. Cir. 1992)). Thus, "the key inquiry under the patent misuse doctrine is whether, by imposing the condition in question, the patentee has impermissibly broadened the physical or temporal scope of the patent grant and has done so with anticompetitive effects." *Id.* (citing *B. Braun Medical, Inc. v. Abbot Labs.*, 124 F.3d 1419, 1426 (Fed. Cir. 1997)); *see also Monsanto Co. v. McFarling*, 363 F.3d 1336, 1341 (Fed. Cir. 2004) (quoting *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1372 (Fed. Cir. 1998)).

5. Waiver

"[W]aiver is the 'intentional relinquishment or abandonment of a known right.'" *United States v. Olano,* 507 U.S. 725, 733 (1993) (quoting *Johnson v. Zerbst*, 304 U.S. 458, 464 (1938)). "To support a finding of implied waiver in the standard setting organization context, the accused must show by clear and convincing evidence that '[the patentee's] conduct was so inconsistent with an intent to enforce its rights as to induce a reasonable belief that such right has been relinquished.'" *Hynix Semiconductor Inc. v. Rambus, Inc.*, 645 F.3d 1336, 1348 (Fed. Cir. 2011) (citing *Qualcomm Inc. v. Broadcom Corp.*, 548 F.3d 1004, 1020 (Fed. Cir. 2008)).

6. Unclean Hands

A complainant who seeks justice must come into court with clean hands or "the doors of the court will be shut." *Aptix Corp. v. Quickturn Design Sys., Inc.*, 269 F.3d 1369, 1375 (Fed. Cir. 2001) (quoting *Keystone Driller Co. v. General Excavator Co.*, 54 S.Ct. 146, 147 (1933)). To prove unclean hands, Arista must prove that Cisco "conducted [itself] as to shock the moral sensibilities of the judge." *Gaudiosi v. Mellon*, 269 F.2d 873, 882 (3d Cir. 1959).

F. Domestic Industry

A violation of section 337(a)(1)(B), (C), (D), or (E) can be found "only if an industry in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned, exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). Section 337(a) further provides:

> (3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned—

> (A) significant investment in plant and equipment;
>
> (B) significant employment of labor or capital; or
>
> (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3).

These statutory requirements consist of an economic prong (which requires certain activities)[19] and a technical prong (which requires that these activities relate to the intellectual property being protected). *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm'n Op. at 13 (May 16, 2008) ("*Stringed Musical Instruments*"). The burden is on the complainant to show by a preponderance of the evidence that the domestic industry requirement is satisfied. *Certain Multimedia Display and Navigation Devices and Systems, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-694, Comm'n Op. at 5 (July 22, 2011) ("*Navigation Devices*").

1. Technical Prong

"With respect to section 337(a)(3)(A) and (B), the technical prong is the requirement that the investments in plant or equipment and employment in labor or capital are actually related to 'articles protected by' the intellectual property right which forms the basis of the complaint."

[19] The Commission practice is usually to assess the facts relating to the economic prong at the time that the complaint was filed. *See Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, Inv. No. 337-TA-560, Comm'n Op. at 39 n.17 (Apr. 14, 2010) ("We note that only activities that occurred before the filing of a complaint with the Commission are relevant to whether a domestic industry exists or is in the process of being established under sections 337(a)(2)-(3).") (citing *Bally/Midway Mfg. Co. v. U.S. Int'l Trade Comm'n*, 714 F.2d 1117, 1121 (Fed. Cir. 1983)). In some cases, however, the Commission will consider later developments in the alleged industry, such as "when a significant and unusual development occurred after the complaint has been filed." *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm'n Op., at 5-6 (Jan. 20, 2012) ("[I]n appropriate situations based on the specific facts and circumstances of an investigation, the Commission may consider activities and investments beyond the filing of the complaint.").

Stringed Musical Instruments at 13-14. "The test for satisfying the 'technical prong' of the industry requirement is essentially same as that for infringement, i.e., a comparison of domestic products to the asserted claims." *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). "With respect to section 337(a)(3)(C), the technical prong is the requirement that the activities of engineering, research and development, and licensing are actually related to the asserted intellectual property right." *Stringed Musical Instruments* at 13.

2. Economic Prong

With respect to the economic prong, and whether or not section 337(a)(3)(A) or (B) is satisfied, the Commission has held that "whether a complainant has established that its investment and/or employment activities are significant with respect to the articles protected by the intellectual property right concerned is not evaluated according to any rigid mathematical formula." *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm'n Op. at 27 (Feb. 17, 2011) ("*Printing and Imaging Devices*") (citing *Certain Male Prophylactic Devices*, Inv. No. 337 TA-546, Comm'n Op. at 39 (Aug. 1, 2007)). Rather, the Commission examines "the facts in each investigation, the article of commerce, and the realities of the marketplace." *Id.* "The determination takes into account the nature of the investment and/or employment activities, 'the industry in question, and the complainant's relative size.'" *Id.* (citing *Stringed Musical Instruments* at 26).

With respect to section 337(a)(3)(C), whether an investment in domestic industry is "substantial" is a fact-dependent inquiry for which the complainant bears the burden of proof. *Stringed Musical Instruments* at 14. There is no minimum monetary expenditure that a complainant must demonstrate to qualify as a domestic industry under the "substantial investment" requirement of this section. *Id.* at 25. There is no need to define or quantify an industry in absolute mathematical terms. *Id.* at 26. Rather, "the requirement for showing the existence of a domestic industry will depend on the industry in question, and the complainant's relative size." *Id.* at 25-26.

V. The '537 (SysDB) Patent

A. Claim Construction

1. Level of Ordinary Skill

Cisco's expert Dr. Almeroth testified that the level of ordinary skill in the field of art of the '537 patent is a person with a Bachelor of Science degree, or its equivalent, in electrical engineering, computer engineering, computer science, or a related field and either a Master of Science degree, or its equivalent, in one of those fields or approximately two years of related experience in the field of network devices. CX-0007C (Almeroth WS) at Q/A 26.

Arista's expert Mr. Hollingsworth testified that a person of ordinary skill in the art in January 2000, the time the application for the '537 patent was filed, would be a person with an undergraduate degree in computer science, computer engineering, electrical engineering, or a closely related field, along with at least 2-3 years of experience working in the field of computer networks. In Mr. Hollingsworth's opinion, superior education or work experience would compensate for a deficiency in the other. RX-3273C (Hollingsworth WS) at Q/A 37.

Both experts for Cisco and Arista agree that a person of ordinary skill in the art with respect to the '537 patent would have at least a Bachelor of Science degree in computer science, computer engineering, or electrical engineering. Cisco's expert also opines that a person of ordinary skill in the art would have a Master of Science degree, an additional requirement that could be satisfied with two years of experience in a relevant field. This is consistent with the opinion of Arista's expert that a person of ordinary skill in the art would have 2-3 years of experience in a relevant field. The experts' proposals differ in the particular field in which that experience should be gained. Cisco's expert proposes the field of "network devices," whereas Arista's expert proposes the field of "computer networks."

In view of the expert testimony, it is determined that a person having ordinary skill in the art of the '537 patent is a person with a Bachelor of Science degree in computer science, computer engineering, electrical engineering, or a closely related field, along with at least 2-3 years of experience working in the field of network devices or computer networks.

2. Disputed Claim Terms

a. "externally managing router data" (claims 1 and 10) / "externally manage router data" (claim 19) / "external management" (claims 1 and 10) / "management of" (claim 19)

Below is a chart setting forth the parties' proposed constructions.[20]

[20] This initial determination addresses only the disputed claim terms identified by the parties as needing construction. *See* Corrected Joint Outline of List of Issues to Be Decided (EDIS Doc. No. 566522) ("Joint Outline of Issues"). The parties identified the claim terms for construction in a joint filing required by Ground Rule 11, which provides: "On the same day the initial posthearing briefs are due, the parties shall file a comprehensive joint outline of the issues to be decided in the final Initial Determination. The outline shall refer to specific sections and pages of the posthearing briefs. Moreover, the claim terms briefed by the parties must be identical. For example, if the construction of the claim term 'wireless device' is disputed, the parties must brief that exact claim term. If a party briefs only a portion of the claim term such as 'wireless' or 'device,' that section of the brief will be stricken." Ground Rule 11 (emphasis original) (attached to Order No. 2 (Issuance of Ground Rules) (Jan. 28, 2015)).

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
The term "externally managing router data" in claims 1 and 10 are part of the preamble, which is not limiting. That term in claim 19 is not part of the preamble but does not need construction.	offloading from the centralized database subsystem control and maintenance of the principal non-cached copy of data required to configure a router	The term "externally manage router data" in claims 1 and 10 are part of the preamble, which is not limiting. That term in claim 19 is not part of the preamble but does not need construction.
The term "external management" does not require construction. If, however, either the preamble is limiting or a construction is necessary, "maintaining router data outside of the centralized database."	controlling and maintaining the principal non-cached copy of data required to configure a router outside the centralized database subsystem	The term "external management" does not require construction.

The phrase "external management" appears in the preambles of claims 1 and 10, and in the body of claim 19. Although the parties disagree on whether the phrase "external management" in the preambles of claims 1 and 10 is a limitation, that dispute is overshadowed by that fact that "external management" is a requirement present in the body of those claims. As proposed by Cisco and the Staff, it is determined that no construction is needed for the claim term "external management." In particular, the construction proposed by Arista introduces terms and concepts that are not supported by the intrinsic evidence.

The claim terms "externally managing router data" and "external management" do not require construction because the meaning of "external management" is plain to a person having ordinary skill. A person having ordinary skill would understand "external management" to mean that the subsystem, which is external to the centralized database system, manages the data. Almeroth Tr. 183-184; CX-0007C (Almeroth WS) at Q/A 62-63. In such circumstances, where "the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words," further construction is not necessary. *Phillips*, 415 F.3d at 1314; *see also U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) (holding that claim construction is not an "exercise in redundancy").

Further construction is unnecessary because the remainder of the claim language itself provides additional information regarding what is required for external management, including precisely what data is managed, where that data is located, and how a subsystem becomes a "managing subsystem." Claim 1, for example, teaches that "external management" involves a "first managing subsystem" that "indicat[es] router configuration data" that it will manage outside the centralized database system by "transmitting a management registration request." *See, e.g.*, JX-0001 ('537 patent) at col. 15, lns. 22-40.

By contrast, Arista's proposed construction is not supported by the intrinsic record. As an initial matter, the terms used by Arista in its construction, *e.g.*, "control" and "principal non-cached copy," are not found in the claims, specification, or prosecution history of the '537 patent. *See, e.g.*, Hollingsworth Tr. 1011; Almeroth Tr. 184. Moreover, inserting "control" in place of "manage" substitutes one word for another without providing a further clarification of meaning. Similarly, inclusion of the term "authoritative" in the proposed construction provides no additional clarity as to the meaning of this phrase.

Accordingly, it is determined that the claim term "external management" and variations thereof do not need construction.

b. "management registration request" (claims 1 and 10) / "management request (claim 19)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
a request to register to provide external management services	request to control and maintain	a request to the sysDB for external management services

The claim terms "management registration request" and "management request" are recited in asserted claims 1, 10, and 19 of the '537 patent. As proposed by Cisco, these terms are construed to mean "a request to register to provide external management services." This construction is consistent with the language of the claims and specification.[21]

According to the claims, the first managing subsystem transmits a "management registration request" "to provide external management services." JX-0001 ('537 patent) at col. 15, lns. 28-32. Consistent with the claims, the specification confirms that a management registration request is a request to register to provide external management services. A "managing subsystem" transmits a "management registration request" to "register to externally manage router configuration data." *Id.* at col. 5 lns. 18-22; *see also id.* at col. 10, lns. 45-47 ("At box 100, a managing subsystem 48 (via local managing unit 52) issues a management registration request to the sysDB 26 for external management services.").

[21] The construction proposed by the Staff is similar to the adopted construction, but with two differences. First, the Staff proposed that the management registration request be transmitted to "the sysDB," as opposed to the "centralized database system," which is the language used in the claims. Second, the Staff's construction refers to a "request," whereas the adopted construction refers to a "request to register," inasmuch as the claims require that the request be for registration.

c. "router configuration data" (claims 1, 2, 10, 11, and 19)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "data relating to configuration of the router."	data required to configure a router	No construction necessary. If construction is necessary, "data about the configuration of the router."

The claim term "router configuration data" is recited in asserted claims 1, 2, 10, 11, and 19 of the '537 patent. As proposed by Cisco and the Staff, it is determined that no construction is needed for the claim term "router configuration data." In particular, the construction proposed by Arista excludes specific types of data identified in the specification as being "router configuration data."

The record reflects that the term "router configuration data" would be understood by one of ordinary skill in the art in the context of the claims and specification. *See* CX-0007C (Almeroth WS) at Q/A 72-73. Indeed, the claim language itself teaches that "router configuration data" is data "derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database." JX-0001 ('537 patent) at col. 18, lns. 35-39. Therefore, reference to the claims themselves would be sufficient for a person having ordinary skill in the art to understand the meaning of the term. Moreover, the '537 patent specification confirms that router configuration data may include any type of "router data" known in the art, listing numerous examples and then expressly stating that router configuration data could include other types of router data as well. *Id.* at col. 3, ln. 64 – col. 4, ln. 11.

By contrast, Arista's proposed construction conflicts with the embodiments of the patent. As an initial matter, the specification of the '537 patent does not limit "router configuration data" to what is "required" to configure a router. JX-0001 ('537 patent) at col. 4, lns. 20-26. Instead, any type of router configuration data would be consistent with the claim language as long as that data is "derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database." JX-0001 ('537 patent) at col. 18, lns. 35-39. Indeed, the specification confirms that a broad variety of data relating to the configuration of a router qualifies as "router configuration data," including any type of "router data" known in the art:

> The configuration information stored on the sysDB may include, for example, Internet protocol (IP) addresses, Ethernet configurations, subnet masks, default routes, protocol configuration, name server information, user and password data, access levels, and other router data as is known in the art.

Id. at col. 3, ln. 67 – col. 4, ln. 5; *see also* col. 6, ln. 66 – col. 7, ln. 3.

This not only includes specific types of data, but broad categories of "router configuration information" such as "fast changing data" or "large amounts of data." *Id.* at col. 4, lns. 20-24.

Accordingly, it is determined that the claim term "router configuration data" does not need construction.

d. "said database" (claims 1 and 10)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
said database system / the centralized database system	Indefinite	Not indefinite

The term "said database" is recited in asserted claims 1 and 10. Arista argues that the term "said database" is indefinite because it could refer to either the "database system," the "database subsystem," or the "managing subsystem." *See* Resp. Br. at 87-89; RX-3273C (Hollingsworth WS) at Q/A 82. By contrast Cisco and Staff disagree that "said database" is indefinite.[22]

Notwithstanding Arista's argument, the claims and specification are clear that the centralized database subsystem's role is "receiving said management registration request" and "registering said first managing subsystem for external management," whereas the centralized database system's role is, among other things, storing router configuration data. JX-0001 ('537 patent) at col. 15, lns. 37-40; CX-0007C (Almeroth WS) at Q/A 77-81. Moreover, claim 2 clarifies that router configuration data is stored in "said database system," and not said database subsystem. JX-0001 ('537 patent), col. 15, lns. 41-43.

Dr. Almeroth's testimony confirms that a person of ordinary skill in the art would be informed with reasonable certainly that the claim term "said database" recited in claims 1 and 10 refers to the "database system." *See* CX-0007C (Almeroth WS) at Q/A 78, Q/A 81; *see also* Hollingsworth Tr. 1040-1041. Accordingly, it is determined that this claim term is not indefinite.

[22] Although Cisco proposed a construction for "said database," Cisco also agrees with Staff's proposal that no construction is necessary. *See* Compl. Br. at 66 n.10.

e. **"reducing computational overhead in a centralized database system" (claims 1 and 10)**

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
Preamble not limiting; if limiting, plain and ordinary meaning which is "reducing the amount of computation in a centralized database system."	reducing transactions, notifications, or verifications processed in a centralized database system	Preamble is limiting. If the preamble is found to be limiting, "reducing multiple dependencies between individual subsystems"

The claim term "reducing computational overhead in a centralized database system" is recited in the preamble of asserted claims 1 and 10. Based on the intrinsic evidence, it is determined that this claim term is limiting.

A preamble limits the scope of a claim if it "recites essential structure or steps, or if it is 'necessary to give life, meaning, and vitality' to the claim. *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (internal citations omitted). "Conversely, a preamble is not limiting 'where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.'" *Id.* (*quoting Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). "'[W]hether to treat a preamble as a claim limitation is determined on the facts of each case in light of the claim as a whole and the invention described in the patent.'" *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006) (quoting *Storage Tech. Corp. v. Cisco Sys., Inc.*, 329 F.3d 823, 831 (Fed. Cir. 2003)).

Arista adduced evidence showing that Cisco added this limitation to claims 1 and 10 during prosecution of the '537 patent. Specifically, the file wrapper shows that Cisco added the phrase "for reducing computational overhead" to distinguish the claims from the prior art. The prosecution history shows that Cisco added the phrase "reducing computational overheard in a centralized database system" to the preamble of claims 1 and 10 to distinguish the claimed invention from the Ciscon reference (RX-3275) and argued that Ciscon "is not an attempt to relieve a database of its computational burden." *See* JX-0007 ('537 Patent Prosecution History) at CSI-ANI-00098149.000342, 389, 456, 465, 468. Cisco argues that the phrase "reducing computational overhead in a centralized database system" should not be read to limit the claims, inasmuch as the Examiner did not accept Cisco's argument that adding this phrase would distinguish the pending claims from the prior art. *See* Compl. Br. at 75-76. Nevertheless, the fact that Cisco amended the pending claims to add this phrase in an attempt to distinguish the prior is enough to render this a limitation of the claims, regardless of whether or not Cisco's arguments with respect to the amendment were ultimately successful.

Inasmuch as Cisco added this phrase during prosecution to distinguish the prior art, it is determined that at least the portions of the preambles of claims 1 and 10 that recite "reducing computational overhead in a centralized database system" are limiting.

Moreover, as proposed by Cisco, the phrase "reducing computational overhead in a centralized database system" is construed to mean "reducing the amount of computation in a centralized database system." This construction reflects the phrase's plain and ordinary meaning to a person of ordinary skill in the art. *See* CX-1217C (Almeroth RWS) at Q/A 42-45.

By contrast, Arista's proposed construction improperly reads in limitations from a description of the prior art. In particular, the '537 patent describes "transaction routines, notification routines, and verification routines" as an "example" of one of the problems with the prior art:

> However, the centralized database scheme is somewhat inefficient when the information stored in the database contains a large amount of data or is changing very fast. For example, when the data in the database is constantly changing (such as statistic counters), the sysDB may have to continuously perform transaction routines, notification routines, and verification routines.

JX-0001 ('537 patent) at col. 2, lns. 58-64.

The specification does not, however, limit "reducing computational overhead" to only the reduction of "transaction routines, notification routines, and verification routines." Indeed, when describing the embodiments of the claimed inventions, the specification refers generally to "computational tasks" without limiting them to items listed in Arista's proposed construction:

> The CPU 12 carries out the computational tasks associated with executing and running the internetwork operating system (IOS) software of the present invention and comprises circuitry or other hardware as is known in the art.

JX-0001 ('537 patent) at col 6, lns. 52-55.

Moreover, the construction proposed by the Staff also reads in a limitation unnecessarily from the specification. The Staff's proposed construction relies on a particular "objective" of the invention, that of reducing multiple dependencies. *See* JX-0001 ('537 patent) at col. 3, lns. 26-29. Although the claimed inventions of the '537 patent do achieve this goal, limiting the construction of the term "reducing computational overhead in a centralized database system" to only this goal is overly narrow. *See E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 (Fed. Cir. 2003) ("An invention may possess a number of advantages or purposes, and there is no requirement that every claim directed to that invention be limited to encompass all of them.").

Accordingly, it is determined that the claim term "reducing computational overhead in a centralized database system" recited in the preambles of claims 1 and 10 are limiting. It is further determined that the claim term "reducing computational overhead in a centralized database system" is construed to mean "reducing the amount of computation in a centralized database system."

f. "said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database" (claims 1, 10, and 19)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
The plain language requires that router configuration data be "stored in said database"	The plain language requires that configuration commands be "stored in said database"	None provided

The parties did not include proposed constructions of this claim term in the parties' Joint Claim Construction Statement. Nevertheless, both Cisco and Arista addressed this claim term in their post-hearing briefs. *See* Compl. Br. at 67-74; Arista Br. at 65-70. Cisco takes the position that "Arista waived this untimely claim construction argument by failing to include it in the Joint Claim Construction Statement." *See* Compl. Br. at 67. Although the claim term was not identified in the parties' Joint Claim Construction Statement, Arista did disclose its argument regarding this term in response to an interrogatory seeking information regarding Arista's non-infringement positions. *See* CX-1011C (Arista's Ninth Supp. Resp. to Cisco's First, Second, Third and Fourth Set of Rogs) at 35. Arista's arguments will be addressed in the section discussing infringement below.

B. Literal Infringement Analysis

As discussed below on a claim-by-claim basis, the record evidence establishes that the accused products satisfy all limitations of the asserted '573 patent.

1. Claim 19

Asserted claim 19 is an independent claim, as are asserted claims 1 and 10. Claim 1 is a method claim, claim 10 is directed to machine-executable instructions, and claim 19 is an apparatus claim. Many of the method steps of claim 1 recite limitations similar to those recited in claim 19. The same holds true with the machine-executable instructions recited in claim 10. Therefore, this initial determination will analyze claim 19 before analyzing claims 1 and 10 (and their associated dependent claims).

a. In a router device having a processor and memory, a router operating system executing within said memory comprising:

The record evidence establishes that the Accused '537 Products practice the preamble of claim 19. As Dr. Almeroth testified, the Accused '537 Products are router devices. CX-0007C (Almeroth WS) at Q/A 125-126. The Accused '537 Products have a processor and memory, and they also execute Arista's EOS, a router operating system, within that memory. *Id.* at Q/A 125-126. This is confirmed by the data sheet for Arista's 7010T-48 device, which demonstrates that the devices have a CPU, system, and flash memory. CX-0166. The data sheet further indicates that EOS runs processes in memory and that the processes "exchange state through an in-memory database." *Id.*

b. (a) a database subsystem;

Cisco adduced evidence showing that the Accused '537 Products practice this limitation. The '537 patent teaches that the "database subsystem" is the part of Sysdb that receives the management registration request from an external subsystem and registers the subsystem for external management. JX-0001 ('537 patent) at col. 15, lns 37-40; col. 16, lns. 64-67; col. 18, ln. 29. As described below with respect to the term "externally manage router data," agents in EOS register for external management by [ ].[23] Thus, as Dr. Almeroth testified, this limitation is satisfied by the portion of Arista's Sysdb that handles the "mounting." CX-0007C (Almeroth WS) at Q/A 127.

c. (b) a plurality of client subsystems, each operatively coupled for communication to said database subsystem,

The evidence establishes that EOS contains numerous "agents," which correspond to the "plurality of client subsystems" recited in claim 19. CX-0007C (Almeroth WS) at Q/A 128. Each agent generally handles a particular feature or set of related features. *Id.* at Q/A 86; CX-0035C at 6. For example, there is an MLAG agent for managing MLAG data, an STP agent for managing STP, and an LED Driver agent for managing LED data. CX-0007C (Almeroth WS) at Q/A 86; CX-0286; CX-1098C; CX-0419C at 1, 6; JX-0034C (Sigoure Dep. Tr.) 85-86; CX-1098C (Transcript of [ ] Presentation) at 3-4. Each of these agents is coupled to EOS's Sysdb, as discussed above. *See* CX-0286 at Fig. 3.

d. one of said client subsystems configured as a managing subsystem to externally manage router data

The record evidence shows that Arista's products satisfy this limitation under the claim constructions adopted above. Specifically, agents in EOS perform external management by [ ]. CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120, Q/A 130, Q/A 134; JX-0026C (Duda Dep. Tr.) 177-178, 192; Almeroth Tr. 191. When an EOS agent [ ] data in Sysdb, [ ]. CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120, Q/A 130, Q/A 134;

[23] Dr. Almeroth testified: "[ ]." CX-0007C (Almeroth WS) at Q/A 88.

see Hollingsworth Tr. 1004; JX-0026C (Duda Dep. Tr.) 192. Moreover, [ ]. CX-0007C (Almeroth WS) at Q/A 91, Q/A 100, Q/A 130, Q/A 134; Hollingsworth Tr. 1005; JX-0026C (Duda Dep. Tr.) 194-195.

The documentary evidence confirms that EOS's agents externally manage data. For example, an Arista internal presentation given by [ ], states that [ ]. CX-0459C ([ ] Presentation) at ANI-ITC-944 945-1732776; *see* Duda Tr. 843; Almeroth Tr. 192; JX-0027C ([ ] Dep. Tr.) 96-97.

A slide from the presentation given by [ ] is reproduced below:

[ ]

CX-0459C ([ ] Presentation) at ANI-ITC-944 945-1732776.

Dr. Almeroth testified regarding the slide at the hearing:

Q. What are we seeing here on this slide?

[

]

Almeroth Tr. 192-193.

Dr. Almeroth further testified that the types of data listed in the presentation are explicitly described by the '537 patent as examples of router configuration data. Almeroth Tr. 193-195.

Arista's expert Dr. Hollingsworth also testified that [ ]. For example, he testified that [ ] presentation shows [ ]:

[ ].

Hollingsworth Tr. 1008.

Dr. Hollingsworth also testified that, that in addition to the examples in the presentation reproduced above, [ ]. Hollingsworth Tr. 1008. Dr. Hollingsworth further testified that [ ]. Hollingsworth Tr. 1009. He testified that [

]:

[

].

Hollingsworth Tr. 1008; *see* CX-1098C (Transcript of [ ] Presentation) at 2-3 (discussing [ ]); Almeroth Tr. 192-193.

Additional evidence establishes that [ ] is pertinent to management. *See* CX-1098C (Transcript of [ ] Presentation) at 42 ("[

]."); CX-0035C at 7 ("[

]"); JX-0034C (Sigoure Dep. Tr.) 98 ("[

].").

e. upon issuing a management request to said database subsystem;

The evidence establishes that the accused products practice this claim limitation because agents in EOS issue a [ ] request to Sysdb indicating [ ]. As discussed above, agents within EOS externally manage data when they [ ]. CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120. The first step of a [

]. *See* CX-0223C; CX-0457C at 15-17, 20. This functionality satisfies the "issuing a management request to said database subsystem" claim limitation under the claim constructions adopted above. CX-0007C (Almeroth WS) at Q/A 138-142.

f. and (c) a database operatively coupled to said database subsystem, said database configured to store router configuration data

Cisco adduced evidence showing that Arista's products have a Sysdb, which stands for "System Database," including a [ ]." CX-1098C (Transcript of [ ] Presentation) at 2-3, 7, 15; CX-0007C (Almeroth WS) at Q/A 206; CX-0459C ([ ] Presentation) at 11. An [ ] is a software construct for a unit of data. CX-0412C; CX-1098C (Transcript of [ ] Presentation) at 15; CX-0035C. The [ ] is a "database" as described in embodiments of the '537 patent. CX-0007C (Almeroth WS) at Q/A 43; *see* JX-0001 ('537 patent) at col. 4, lns. 30-38. Sysdb is "operatively coupled" to the database subsystem because [ ]. CX-0007C (Almeroth WS) at Q/A 143. As explained in more detail below, the "data" stored in Sysdb is "router configuration data."

g. and delegate management of router configuration data to a management subsystem that requests to manage router configuration data,

As demonstrated by the record evidence, when Sysdb processes the write-mount request described above, Sysdb permits the requesting agent to externally manage the data, and therefore "delegates management" of that data to that agent as recited in this claim limitation. CX-0007C

(Almeroth WS) at Q/A 144. As further explained below, the "data" that is externally managed is "router configuration data." Upon receiving a [ ] from an agent, Sysdb will perform the next series of steps [ ]. CX-0223C at 11; CX-0457C at 16, 19-20. [ ]. CX-0223C at 11-14; CX-0457C at 23. Dr. Almeroth testified that this functionality is present in Arista's source code for Sysdb. CX-0007C (Almeroth WS) at Q/A 95, Q/A 99.

h. said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database.

Cisco has adduced evidence showing that the accused products satisfy this claim limitation under the constructions adopted above. As Dr. Almeroth testified, the claimed router configuration data is "managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database." CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120, Q/A 144-162 Q/A 170; *see* CX-0434C; CX-0430C.

The evidence shows that [ ]. CX-0007C (Almeroth WS) at Q/A 100-120, Q/A 130, Q/A 144-156, Q/A 175; CX-0285 at 460, 964; CX-0500C; CX-0413C. [ ]. CX-0007C (Almeroth WS) at Q/A 102-106, Q/A 126; CX-0413C at 2, ANI-ITC-944_945-0086713; CX-0417C at 6; CX-1098C (Transcript of [ ] Presentation) at 44. Next, [

]. CX-0007C (Almeroth WS) at Q/A 146. [ ]. CX-0007C (Almeroth WS) at Q/A 146; *see* Hollingsworth Tr. 1032, 1077-1078. [ ]. CX-0007C (Almeroth WS) at Q/A 108-109, Q/A 111, Q/A 115-116, Q/A 130, Q/A 138, Q/A 146, Q/A 155.

The evidence therefore demonstrates that [ ], and constitutes the claimed "router configuration data" that is "derived from configuration commands supplied by a user." Further, the evidence shows that [ ] is "derived from" user-supplied configuration commands through a series of steps "before being stored in said database" where "said database" refers to [ ]. CX-0007C (Almeroth WS) at Q/A 146.

Arista raises several non-infringement arguments with respect to infringement of this claim limitation. As discussed below, each of Arista's arguments fails.

Arista argues that "Cisco has failed to identify any 'router configuration data' derived from commands supplied by a user as being externally managed in Arista switches." *See* Resp. Br. at 104-06. Arista's argument rests on a criticism of Dr. Almeroth's identification of the [ ] as producing "router configuration data." *See* Hollingsworth Tr. 1037-1038. Arista argues that the [ ] does not produce "router configuration data," but is instead concerned with [ ]. *See* Resp. Br. at 105-06. The record evidence, however, does not support Arista's argument.

Dr. Almeroth testified that, when the configuration commands [ ]. CX-0007C (Almeroth WS) at Q/A 112-119. As a result of these commands, [ ]. *Id.* This constitutes "router configuration data," inasmuch as the patent states that "network interface statistic counter information" is a type of such data. JX-0007C (Almeroth WS) at Q/A 73, Q/A 76; *see* JX-0001 ('537 patent) at col. 4, lns. 20-26. Accordingly, it has been shown that the [ ], which is reflected by the [ ], is the claimed "router configuration data."

In addition, the evidence shows that other agents within EOS manage "router configuration data." Dr. Almeroth testified that other agents, such as [ ] all manage router configuration data. Almeroth Tr. 192-195. Specifically, these agents manage protocol configuration information, which is identified in the patent specification as a type of router configuration data. *Id.*; JX-0001 ('537 patent) at col. 3, ln. 67 – col. 4, ln. 5. Dr. Almeroth also described the overall process for how [ ]." CX-0007C (Almeroth WS) at Q/A 144-162.

Arista also argues that the output of the agents in EOS, which Arista refers to as [ ] data, does not constitute "router configuration data." *See* Resp. Br. at 105; RX-3909C (Hollingsworth RWS) at Q/A 107. Under the construction of "router configuration data" adopted above, however, such [ ] is router configuration data. Moreover, Dr. Almeroth testified that [ ]. CX-0007C (Almeroth WS) at Q/A 153; *see* CX-0419C at 2 ([ ]); RX-3912C (Duda RWS) at Q/A 8.

With respect to the claim limitation "storing commands," Arista argues that "storing commands" requires storing the command as entered by the user. *See* Resp. Br. at 92-94. As discussed above in the section addressing claim construction, Arista did not raise this issue in the parties' Joint Claim Construction Statement. Moreover, the intrinsic evidence does not support the limitation of this phrase to storing the actual commands as entered by the user. Nevertheless, the evidence establishes that [ ]. *See* CX-0007C (Almeroth WS) at Q/A 155, Q/A 162; Hollingsworth Tr. 1034. Accordingly, Arista's argument must fail.

2. Claim 1

Independent method claim 1 recites many limitations similar to those recited in independent apparatus claim 19, analyzed above. As with claim 19, the record evidence shows that the accused products satisfy all limitations of claim 1.

a. A method for reducing computational overhead in a centralized database system

As discussed in the previous section with respect to claim construction, the preamble claim term "reducing computational overhead" was determined to be limiting and was construed to mean "reducing the amount of computation in a centralized database system." The record evidence establishes that the Accused '537 Products meet this limitation under the adopted construction because [

]. In particular, Dr. Almeroth testified that this architecture reduces computational overhead in the centralized database system (Sysdb) by reducing the amount of computation in that centralized database system. CX-0007C (Almeroth WS) at Q/A 163-182; *see also* Hollingsworth Tr. 1036 ("'[

].'").

b. by externally managing router data in conjunction with a centralized database subsystem, said database subsystem operatively coupled for communication with a plurality of router subsystems one of which is a first managing subsystem, comprising:

Dr. Almeroth testified that the Accused '537 Products meet this element under the adopted claim constructions for the same reasons as explained above with respect to claim 19. In particular, the external management is "in conjunction with a centralized database subsystem" because the centralized database subsystem within Sysdb handles the [

]. CX-0007C (Almeroth WS) at Q/A 127. In addition, as discussed above with respect to claim 19, the database subsystem is coupled to a plurality of router subsystems, one of which is a first managing subsystem. CX-0007C (Almeroth WS) at Q/A 86, Q/A 128; CX-1098C (Transcript of [ ] Presentation) at 3-4.

c. a) transmitting a management registration request by said first managing subsystem to said database subsystem,

As Dr. Almeroth testified the Accused '537 Products meet this element under the adopted claim constructions for the same reasons discussed above with respect to the "management request" of claim 19. CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120.

d. **said registration request indicating router configuration data for which said first managing subsystem is requesting to provide external management services,**

The record establishes that the Accused '537 Products meet this element under the adopted claim constructions for the same reasons set forth above with respect to the "management request" limitation of claim 19. In particular, Dr. Almeroth testified that the limitation "indicating router configuration data for which said first managing subsystem is requesting to provide external management services" is met due to the [ ]. CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120.

e. **said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database;**

Dr. Almeroth testified that the router configuration data present in the accused Arista products satisfies this element for the reasons set forth with respect to claim 19 discussed above. CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120, Q/A 144-162, Q/A 170.

f. **b) receiving said management registration request by said database subsystem;**

The record evidence shows that the Accused '537 Products satisfy this claim limitation. In particular, Dr. Almeroth testified that in Arista's EOS, [ ] for at least the reasons discussed with respect to claim 19. CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120. Moreover, the part of Sysdb that receives the mount request in order to perform the mount is the claimed "database subsystem." *See id.*

g. and c) registering said first managing subsystem for external management by said database subsystem.

Dr. Almeroth testified that the Accused '537 Products satisfy this limitation. Specifically, in Arista's EOS, [ ] for at least the reasons explained with respect to claim 19. *See* CX-0007C (Almeroth WS) at Q/A 90-91, Q/A 100-120. The part of Sysdb that receives the mount request in order to perform the mount, thereby registering the agent for external management, is the "database subsystem." *See id.*

3. Claim 2

a. The method of claim 1 further comprising

As set forth above, the record evidence shows that the accused products satisfy the limitations of claim 1.

b. maintaining router configuration data using a tree structure having a plurality of tuples by said database system.

As Dr. Almeroth testified, EOS maintains router configuration data using [ ]. CX-0007C (Almeroth WS) at Q/A 206; CX-0459C at 11; CX-0412C; CX-0035C at 18-19.

It is therefore determined that the accused products satisfy the limitations of claim 2.

4. Claim 8

a. The method of claim 1 further comprising:

As set forth above, the record evidence shows that the accused products satisfy the limitations of claim 1.

b. (a) transmitting a change request for router data by a requesting subsystem to said database subsystem;

The evidence shows that the accused products satisfy this limitation. As Dr. Almeroth testified, the '537 Accused Products transmit a change request for router data by a requesting subsystem to said database subsystem. CX-0007C (Almeroth WS) at Q/A 212-219.

In Arista's EOS, [ ]. CX-0007C (Almeroth WS) at Q/A 213-214; CX-0035C at 18. For example, [ ]. CX-0417C; CX-0035C at 14-15. [ ], and therefore satisfies the "requesting subsystem" limitation of claim 8.

c. (b) receiving said change request by said database subsystem;

Dr. Almeroth testified that Sysdb receives the change request by the database subsystem discussed above. CX-0007C (Almeroth WS) at Q/A 215. This limitation is therefore satisfied by the accused products.

d. (c) determining whether said router data is externally managed by a second managing subsystem; and

The evidence establishes that the accused products satisfy this claim limitation. Dr. Almeroth testified that the Arista products determine whether the router data is externally managed by a second managing subsystem when [

]. CX-0007C (Almeroth WS) at Q/A 216. Sysdb knows which agents have [ ], and which agents have [ ]. CX-0007C (Almeroth WS) at Q/A 100-120, Q/A 216; *see* JX-0026C (Duda Dep. Tr.) 199-200. Therefore, Sysdb would learn [ ]. CX-0007C (Almeroth WS) at Q/A 100-120, Q/A 216. Accordingly, when [ ] and is therefore a "second managing subsystem." *Id.*

e. (d) requesting a data change for said router data to said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem.

Dr. Almeroth testified that the claim limitation is satisfied when Sysdb propagates the change update to the second managing subsystem so that it will change its own data. CX-0007C (Almeroth WS) at Q/A 216.

5. Claim 9

a. The method of claim 8 further comprising:

As set forth above, the record evidence shows that the accused products satisfy the limitations of claim 8.

b. a) determining whether said router data is locally cached; and b) updating the cache value to said router data when said router data is locally cached.

Evidence adduced at the hearing establishes that the Accused '537 Products satisfy these additional limitations of claim 9. As Dr. Almeroth testified, Arista's products determine whether the router data is locally cached because [ ]. CX-0286; CX-1098C; CX-0414C; CX-0434C; CX-0286; CX-0223C; CX-0035C; CX-0007C (Almeroth WS) at Q/A 220. Arista products update the cache value to said router data when said router data is locally cached because [

]. CX-0007C (Almeroth WS) at Q/A 220.

6. Claim 10

Asserted claim 10 of the '537 patent is nearly identical to asserted independent method claim 1, with the exception of the claim terms "program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine" and "registering said first managing subsystem for external management by said managing subsystem." The evidence shows that Arista's Accused '537 Products contain a "program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine" because they run EOS, [ ]. CX-0166. Moreover, agents within EOS register for external management by [ ] and additionally by [

]. CX-0007C (Almeroth WS) at Q/A 98.

Therefore, for these reasons and the reasons discussed above with respect to claim 1, it is determined that the accused Arista products satisfy all limitations of claim 10.

7. Claim 11

a. The program storage device of claim 10, said method further comprising

As set forth above, the record evidence shows that the accused products satisfy the limitations of claim 10.

b. maintaining router configuration data using a tree structure having a plurality of tuples by said database system.

This additional limitation is identical to the limitation recited in claim 2. For the reasons discussed above with respect to asserted claim 2, it is determined that the Accused '537 Products infringe claim 11.

8. Claim 17

a. The program storage device of claim 10, said method further comprising:

As set forth above, the record evidence shows that the accused products satisfy the limitations of claim 10.

b. (a) transmitting a change request for router data by a requesting subsystem to said database subsystem; (b) receiving said change request by said database subsystem; (c) determining whether said router data is externally managed by a second managing subsystem; and (d) requesting a data change for said router data to said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem.

These additional limitations are identical to limitations recited in claim 8. For the reasons discussed above with respect to asserted claim 8, it is determined that the Accused '537 Products infringe claim 17.

9. Claim 18

a. The program storage device of claim 17, said method further comprising:

As set forth above, the record evidence shows that the accused products satisfy the limitations of claim 17.

b. (a) determining whether said router data is locally cached; and (b) updating the cache value to said router data when said router data is locally cached.

These additional limitations are identical to limitations recited in claim 9. For the reasons discussed above with respect to asserted claim 9, it is determined that the Accused '537 Products infringe claim 18.

C. Indirect Infringement

1. Specific Intent and Knowledge of the Asserted Patents

Indirect infringement requires that the infringer have specific intent to encourage infringement. *Commil USA, LLC v. Cisco Sys., Inc.,* 135 S. Ct. 1920, 1928 (2015) ("Section 271(b) requires that the defendant 'actively induce[d] infringement.' That language requires intent to 'bring about the desired result,' which is infringement."); *see also Global-Tech Appliances, Inc., v. SEB S.A.*, 131 S. Ct. 2060 (2011). Such specific intent can be shown by, for example, (1) changes in importation practices effectuated to shift infringement liability, (2) the infringer's copying of patented technology, and (3) the infringer's willful blindness of the underlying direct infringement. *See, e.g., SynQor, Inc. v. Artesyn Techs., Inc.*, 709 F.3d 1365, 1384–85 (Fed. Cir. 2013); *Commil USA, LLC*, 135 S. Ct. at 1924-25; *Global-Tech*, 131 S. Ct. at 2071-72.

"Willful blindness" is sufficient to meet the knowledge and specific intent requirement of induced infringement. *Global-Tech*, 131 S. Ct. at 2071-72. A finding of willful blindness requires (1) the subjective belief in the high probability that a fact exists, and (2) the taking of deliberate steps to avoid learning of that fact. *Id.* at 2070. The first prong may be found upon a showing that the party "was successful in its attempts to develop various functions covered by the [asserted] patent into its products." *See, e.g., Suprema*, 796 F.3d. at 1343. The failure to obtain opinion of counsel through which infringing conduct and/or the asserted patent(s) can be discovered can also support a finding of deliberate avoidance. *Suprema, Inc. v. Int'l Trade Comm'n*, 2015 WL 5315371, *7 (Fed. Cir. Sept. 14, 2015) (panel remand).

As discussed below, Arista's actions indicate that it had specific intent to encourage infringement.[24]

The record evidence shows that Arista changed its importation practices soon after Cisco filed the complaint in this investigation. [

]. *See* CX-1009C (Arista's First Supplemental Response to Interrogatory No. 40); Metivier Tr. 1161. The evidence shows that [

]. Metivier Tr. 1162-1163, 1167, 1174-1175; JX-0029C (Metivier Dep. Tr.) 96. [

]. RX-3914C (Metivier WS) at Q/A 63, Q/A 66, Q/A 69; Metivier Tr. 1162, 1163; CX-1213C; CX-1009C (Arista's Third Supplemental Response to Interrogatory No. 40). [

] therefore lead to the conclusion that Arista had a specific intent to induce infringement through the importation of the accused products.

In addition, the evidence shows that Arista [ ] Cisco products in developing Arista's products. *See, e.g.*, CX-0206C; JX-0026C; JX-0033C; CX-0201C;

[24] The discussion of Arista's specific intent to encourage infringement also applies to the analysis of the other patents asserted in this investigation.

CX-0198C; CX-0210C; CX-0200C; CX-0205C; CX-0209C; JX-0022C (Cheriton Dep. Tr.) 104, 105; JX-0042C (Ullal Dep. Tr.) 178-179; JX-0033C (Sadana Dep. Tr.) 27; CX-0001C (Wicker WS) Q/A 220-225; CX-0003C (Jeffay WS) Q/A 372-376; CX-0007C (Almeroth WS) Q/A 238-242; CX-0008C (Bhattacharjee WS) Q/A 362-366. Cisco has presented [

]. *See, e.g.*, CX-0206C, CX-0201C, CX-0198C, CX-0210C, CX-0200C; CX-0205C; CX-0209C; Sadana Tr. 1299-1300. For example, [

]" CX-0205C; CX-0198C; Sadana Tr. 1299-1300. Arista's Chief Technology Officer, Kenneth Duda, testified [

]. JX-0026C (Duda Dep. Tr.) 217-219, 482-483. Mr. Duda also testified that [

]. CX-0206C; Duda Tr. 837, 838. Similarly, in several instances Anshul Sadana, Arista's Senior Vice President of Customer Engineering, testified that [

]. JX-0033C (Sadana Dep. Tr.) 211-212, 217, 221, 228, 231. Moreover, Arista's CEO also testified that [

]. JX-0042C (Ullal Dep. Tr.) 58, 61.

The record evidence also supports a finding that Arista at least intentionally and willfully blinded itself to knowledge of Cisco's patented technology and Arista's infringing conduct. That there was a high probability of Arista's subjective belief that it was infringing Cisco's patents is shown by [ ]. *See, e.g.*, JX-0026C (Duda Dep. Tr.) 217-219, 481, 482-483; JX 0033C (Sadana Dep. Tr.)

211-212, 217, 221, 228, 231; CX-0206C; CX-0201C; CX-0198C; CX-0210C; CX-0200C; CX-0205C; CX-0209C; Sadana Tr. 1299; Arneja Tr. 1120-1121; CX 0001C (Wicker WS) Q/A 226-228; CX-0003C (Jeffay WS) Q/A 377-380; CX-0007C (Almeroth WS) Q/A 243-246; CX-0008C (Bhattacharjee WS) Q/A 367-370. Additionally, the record evidence shows that [ ]. For example, Mr. Sadana testified that, at Arista, [ ]. JX-0033C (Sadana Dep. Tr.) 221. As another example, Mr. Bechtolsheim, Arista's co-founder, testified that [ ]. JX-0020C (Bechtolsheim Dep. Tr.) 247. Similarly, Mr. Duda testified that [ ]." Duda Tr. 789. According to Mr. Duda, [ ]. JX-0026C (Duda Dep. Tr.) 159-160, 166. Therefore, the evidence establishes that Arista was willfully blind to Cisco's patented technology, thereby showing knowledge and specific intent to cause infringement of the asserted patents.

Additionally, indirect infringement, both contributory infringement and induced infringement, requires that the infringer act with knowledge of the patent(s)-at-issue and infringement thereof. *See, e.g.*, *Aro Mfg. Co. v. Convertible Top Replacement Co., Inc.*, 377 U.S. 476 (1964); *Global-Tech*, 131 S. Ct. at 2060. As a preliminary matter, Arista had knowledge of the patents asserted in this investigation at least as early as December 4, 2014, by virtue of Cisco's filing of a complaint against Arista in the Northern District of California, and asserting the same patents asserted in this investigation. *See e.g.*, CX 1003C; CX-0001C (Wicker WS) Q/A 217-219; CX-0003C (Jeffay WS) Q/A 371; CX 0007C (Almeroth WS) Q/A 236-237; CX-0008C (Bhattacharjee WS) Q/A 360-361. Therefore, it is determined that Arista had specific knowledge of the patents in suit such that it could be liable for inducing infringement and contributory infringement.[25]

2. Direct Infringement of the '537 Patent in the United States

Evidence shows that Arista's customers use the Accused '537 Products, including using Sysdb, in the United States. Arista's witnesses have testified that its customers use Sysdb each and every time they operate the Accused '537 Products, and that Arista intends for customers to use the Arista devices this way. JX-003C (Sadana Dep. Tr.) 55-57, 75, 77-78; JX-0026C (Duda Dep. Tr.) 201-13, 330; JX-0031C (Pech Dep. Tr.) 17-18; JX-0034C (Sigoure Dep. Tr.) 18-20, 27-28, 59, 66, 84-85; CX-0479; CX-0007C (Almeroth WS) at Q/A 231-235. These customers include, for example, [ ]. CX-0007C (Almeroth WS) at Q/A 233-235; CX-0347C ([ ]); CX-0236C ([ ]); CX-0237C ([ ]); CX-0270C ([ ]); CX-0260C ([ ]); CX-0482C ([ ]); CX-0261C ([ ]); CX-0262C ([ ]); CX-0269C ([ ]); CX-0266C ([ ]); CX-0267C ([ ]); CX-0268C ([ ]); CX-0264C ([ ]); CX-0265C ([ ]); CX-0331C (ANI-ITC-944_945-1602302); CX-0329C (ANI-ITC-944_945-1614091); CX-0330C (ANI-ITC-944_945-1624373); RX-3879C (Duda WS) at Q/A 6.

[25] The discussion of Arista's knowledge of the infringing acts also applies to the analysis of the other patents asserted in this investigation.

The evidence cited above shows that the Accused '537 Products are used by Arista's customers to meet each limitation of each of the asserted claims in the United States and, moreover, that Arista is aware of its customers' use of Sysdb.

Arista argues that there cannot be direct infringement of the '537 patent at the time of importation because [ ]. *See, e.g.*, RX-3909C (Hollingsworth WS) at Q/A 132-145. Nevertheless, as discussed above in the section addressing importation issues, the record evidence shows that the accused devices [ ]. This alone is sufficient to establish direct infringement at the time of importation. *See, e.g.*, *Certain Absorbent Garments*, Inv. No. 337-TA-508, Order No. 16, 2004 WL 2251882, at *2 (Aug. 20, 2004). In addition, [ ]. *See, e.g.*, CX-1349C (Benson WS) at Q/A 15, Q/A 21-27; Benson Tr. 1438-1439, 1454, 1456, 1460-1461. It was established that [ ]. *See* Benson Tr. 1448.

3. Induced Infringement of the '537 Patent

Arista is liable for actively inducing third parties to infringe the '537 patent. Arista knowingly induces infringement by encouraging, instructing, and enabling third parties to use the Accused Products in a manner that infringes the asserted claims of the '537 patent. *See, e.g.*, CX-0007C (Almeroth WS) Q/A 275-279. The record establishes that Arista knows and intends that [ ], and that Arista encourages, aids, facilitates, and otherwise causes use of EOS. *See* JX-0026C (Duda Dep. Tr.) 212-213;

CX-0273 (Arista document promoting EOS, stating that Sysdb is the "key to EOS benefits"); CX-0256C at ANI-ITC-944_945-3933367 (Sysdb provides [ ]). Inasmuch as the Sysdb functionality is [ ], Arista promotes and instructs the use of Sysdb [ ]. JX-0026C (Duda Dep. Tr.) 212-213 ("[ ]."); JX-0033C (Sadana Dep. Tr.) 75. Evidence of Arista's active inducement includes numerous Arista customer presentations, documents, and manuals. *See, e.g.*, CX-0214; CX-0075; CX-0273; CX-0286; CX-0673; CX-0335; CX-0328C; CX-0283C; CX-0279C; CX-0257C; CX-0256C; CX-0274C; CX-0324C; CX-0282C; CX-0281C; CX-0280C; CX-1031C.

Arista's sales and promotion of switch hardware also induces infringement of the '537 patent because the hardware is designed to run the EOS software, which contains Sysdb. *See e.g.*, CX-0175; JX-0026C (Duda Dep. Tr.) 204-207; 212-213; 273-275; 861; JX-0033C (Sadana Dep. Tr.) 75; Metivier Tr. 1167, 1173; CX-0035C.

4. Contributory Infringement of the '537 Patent

Arista is also liable for contributory infringement of the '537 patent. The components implicated in Arista's contributory infringement of the '537 are the Accused Products with EOS, which are a material part of the claimed invention with no substantial noninfringing uses. Arista's contention that [ ] does not absolve Arista of its liability for contributory infringement. *See, e.g.*, CX-0007C (Almeroth WS) Q/A 249-251. Focusing just on the switch hardware as the component, the switch hardware is described in the claim limitations of the asserted claims of the '537 patent, and is therefore material to the invention. *See* JX-0001 ('537 patent). Switch hardware, [

], is particularly necessary for independent apparatus claims 10 and 19, and is material with respect to performing each of the steps of the limitations in independent method claim 1.

The switch hardware has no substantial non-infringing uses because it is designed for and used exclusively with EOS, which contains the infringing Sysdb functionality. *See e.g.*, CX-0007C (Almeroth WS) Q/A 252-273. [

], also contribute to infringement because [

], and lack any actual substantial noninfringing use. *See* CX-0007C (Almeroth WS) Q/A 252-273.

D. Technical Prong of the Domestic Industry Requirement

The record evidence demonstrates that the '537 patent domestic industry products ("'537 DI Products") running Cisco's IOS XR operating system practice the asserted claims of the '537 patent. CX-0007C (Almeroth WS) at Q/A 283-293.

1. Claim 19

a. In a router device having a processor and memory, a router operating system executing within said memory comprising:

The record evidence establishes that the '537 DI Products practice the preamble of claim 19. Dr. Almeroth testified that the '537 DI Products are router devices because they perform routing tasks. CX-0007C (Almeroth WS) at Q/A 310-311; CX-0465 (CRS Data Sheet) at 5. For example, the term "CRS" in the product name CRS-1 stands for "Carrier Routing System." CX-0007C (Almeroth WS) at Q/A 311; CX-0465. The evidence further shows that the '537 DI Products have a processor and memory, and also run a router operating system, IOS XR, executing within that memory. CX-0007C (Almeroth WS) at Q/A 310-311; CX-0464 (IOS XR Fundamentals); CX-0465 at 5.

b. (a) a database subsystem;

The '537 patent teaches that the "centralized database system," or "database subsystem," is the part of sysDB that receives the management registration request from a subsystem and registers the subsystem for external management. JX-0001 ('537 patent) at claims 1, 10, 19. Accordingly, Dr. Almeroth testified that the database subsystem limitation of claim 19 is satisfied by the part of Cisco's SysDB that handles registering EDMs. CX-0007C (Almeroth WS) at Q/A 312; CX-0471C (IOS ENA Guide) at 15-5, 15-9, 15-11–15-12, 15-47.

c. (b) a plurality of client subsystems, each operatively coupled for communication to said database subsystem,

The evidence shows that IOS XR includes a number of processes, each generally focused on particular activities, *e.g.*, activities related to carrying out a particular routing protocol. CX-0007C (Almeroth WS) at Q/A 284, Q/A 313. These processes are "operatively coupled" to the subsystem in SysDB that handles EDM registration requests at least because they transmit the EDM registration requests to SysDB. *Id.* at Q/A 313. Accordingly, the '537 DI Products satisfy this claim limitation.

d. one of said client subsystems configured as a managing subsystem to externally manage router data

The record evidence establishes that the '537 DI Products satisfy this claim limitation under the claim constructions adopted above. In particular, it has been shown that a process in IOS XR can register as an "EDM." After registration, the EDM is in charge of, among other things, making changes to and responding to query requests for the data that it manages. CX-0007C (Almeroth WS) at Q/A 282-285, Q/A 295-307, Q/A 315; CX-0464 (IOS XR

Fundamentals); CX-0471C (IOS ENA Guide). Cisco documents state that "the EDM is responsible for processing all operations relating to items in the area of the namespace that it manages." CX-0471C at 15-5. Thus, any "create, delete, set and/or get" requests regarding that data, called "access request[s]," that are sent by the various processes to SysDB, get "redirected by SysDB to the EDM application" for processing by the EDM. CX-0464 at 47; CX-0471C at 15-47-15-48. As a result, other processes that want to obtain copies of or change data for which there is a registered EDM work through SysDB to send either query requests or change requests to the EDM, and the EDM either returns the value, or changes the value and returns it, depending on the request. CX-0007C (Almeroth WS) at Q/A 285, Q/A 295-319; CX-0471C at 15-5, 15-9, 15-47, 15-48; CX-0464 at 47. Even though the data is externally managed, "[t]he client accessing the items does not need to know that they are stored outside SysDB, as it uses the same SysDB API calls to do so." CX-0471C at 15-5. "Client programs communicate with an instance of the SysDB client library via the SysDB API." *Id.*; CX-0007C (Almeroth WS) at Q/A 285, Q/A 295-319, Q/A 299.

Accordingly, the '537 DI Products satisfy this claim limitation because data is stored in the EDM and managed or maintained by it there, and also because the EDM has the most up-to-date data inasmuch as it changes its copy of the data first. CX-0007C (Almeroth WS) at Q/A 285, Q/A 295-319.

e. upon issuing a management request to said database subsystem;

Cisco adduced evidence showing that a process can register with SysDB to be an EDM for a set of data it identifies in a registration request. CX-0007C (Almeroth WS) at Q/A 285-286; CX-0471C at 15-5; CX-0464 (IOS XR Fundamentals) at 47. The Cisco documentation explains how a process registers as an EDM, an operation that is shown in the Cisco source code. CX-0007C (Almeroth WS) at Q/A 286-291, Q/A 294; CX-0471C (IOS ENA Guide) at 15-47; CX-0464. Accordingly, it has been shown that the '537 DI Products satisfy this claim limitation under the claim constructions adopted above.

f. and (c) a database operatively coupled to said database subsystem, said database configured to store router configuration data

As demonstrated by the record evidence, IOS XR's SysDB stores "config" and "oper" data, and therefore is the claimed database configured to store router configuration data. CX-0007C (Almeroth WS) at Q/A 306, Q/A 309, Q/A 320, Q/A 325-327; CX-0471C (IOS ENA Guide) at 15-2; CX-0464 (IOS XR Fundamentals) at 46. SysDB is "operatively coupled" to the database subsystem because the database subsystem is a part of SysDB. CX-0007C (Almeroth WS) at Q/A 306, Q/A 309, Q/A 320, Q/A 325-327. As explained further below, the data stored in SysDB is router configuration data. Accordingly, the '537 DI Products satisfy this claim limitation.

g. and delegate management of router configuration data to a management subsystem that requests to manage router configuration data,

The evidence shows that the '537 DI Products satisfy this claim limitation because they delegate management to a management subsystem. In particular, a process requests to serve as an external data manager by transmitting a registration request to SysDB. CX-0007C (Almeroth WS) at Q/A 285-286; CX-0464 (IOS XR Fundamentals) at 47; CX-0471C (IOS ENA Guide) at 15-5, 15-9, 15-11–15-12, 15-47. When SysDB processes that request and registers the process as an EDM, SysDB has delegated management to the EDM. CX-0007C (Almeroth WS) at Q/A 282-285, Q/A 295-307, Q/A 315; CX-0464; CX-0471C.

h. said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database.

Cisco has adduced evidence showing that the EDMs in Cisco's IOS XR externally manage "router configuration data." Specifically, Cisco's domestic industry products externally manage all statistical information and real-time counters for ports, which the '537 patent identifies as types of router configuration data. *See* CX-0007C (Almeroth WS) at Q/A 326-333; JX-0001 ('537 patent) at col. 4, lns. 20-26 ("certain router configuration information . . . [f]or example, network interface statistic counter information"); CX-0464 (IOS XR Fundamentals) at 46-48; CX-0471C (IOS ENA Guide) at 15-8; *see also* Hollingsworth Tr. 1044-1045 ("[I]f you're managing all the fast-changing or large amounts of data, you're going to be also managing router configuration data.").

The evidence also establishes that the router configuration data in the '537 DI Products is derived from user-supplied commands. The user of a Cisco switch inputs commands into the command-line interface. These commands configure the device in various ways, *e.g.*, by starting or stopping processes or agents, changing parameters of operation of protocols or processes the device is running such as changing the protocol up or down status of a port, and are therefore the claimed "configuration commands supplied by a user." CX-0007C (Almeroth WS) at Q/A 326-329, Q/A 333; CX-0464 (IOS XR Fundamentals) at 46-47; CX-0471C (IOS ENA Guide) at 15-8. Next, these configuration commands are executed by the CLI process, which is the claimed "router configuration subsystem." CX-0007C (Almeroth WS) at Q/A 326-329, Q/A 333. The output of the CLI process's execution of the configuration commands is named "cfg" and stored in Sysdb. *Id.* at Q/A 326-329, Q/A 333; CX-0464 at 46-48, 107-108. Sysdb then requests that the managing process apply the "cfg." CX-0007C (Almeroth WS) at Q/A 326-329, Q/A 333; CX-0464 at 47-4. This application of configuration changes based on the user-issued command results in changes to the "oper" data and other fast-changing or complex data, such as route tables, statistics, and counters, which are among the types of router configuration data stored in Sysdb and managed by EDMs. CX-0007C (Almeroth WS) at Q/A 326-329, Q/A 333; CX-0464 at 46-48; CX-0471C at 15-8. Thus, the "oper" data is derived from configuration commands supplied by a user and satisfies the "router configuration data" claim limitation. CX-0007C (Almeroth WS) at Q/A 326-329, Q/A 333; CX-0464 at 46-48; CX-0471C at 15-8; *see also* CX-0007C (Almeroth WS) at Q/A 300-307 (providing a particularized example of how this process flow is implemented in IOS XR).

Accordingly, it is determined that the '537 DI Products satisfy this claim limitation.

2. Claim 1

Independent method claim 1 recites many limitations similar to those recited in independent apparatus claim 19, analyzed above. As with claim 19, the record evidence shows that the '537 DI Products practice all limitations of claim 1.

a. A method for reducing computational overhead in a centralized database system

As discussed in a previous section with respect to claim construction, the preamble claim term "reducing computational overhead" was determined to be limiting and was construed to mean "reducing the amount of computation in a centralized database system." The record evidence establishes that the '537 DI Products practice this limitation under the adopted construction because the EDM externally manages the data, thereby reducing the work to be done by SysDB. In particular, the evidence states that "the EDM is responsible for processing all operations relating to items in the area of the namespace that it manages," and that "by moving the configuration-derived data into the external data managers, you add less workload into SysDB." CX-0471C (IOS ENA Guide) at 15-5, 15-9, 15-47, 15-48; JX-0054C (Kathail Dep. Tr.) 136. Accordingly, any "create, delete, set and/or get" requests regarding that data, called "access request[s]," that are sent by the various processes to SysDB, get "redirected by SysDB to the EDM application" for processing by the EDM. CX-0464 (IOS XR Fundamentals) at 47.

b. by externally managing router data in conjunction with a centralized database subsystem, said database subsystem operatively coupled for communication with a plurality of router subsystems one of which is a first managing subsystem, comprising:

Dr. Almeroth testified that the '537 DI Products practice this claim limitation under the adopted claim constructions for the same reasons set forth above with respect to claim 19. In particular, the external management is "in conjunction with a centralized database subsystem" because the centralized database subsystem within SysDB handles the write-mount requests in SysDB. CX-0007C (Almeroth WS) at Q/A 282-285, Q/A 295-307, Q/A 315; CX-0464; CX-0471C.

c. a) transmitting a management registration request by said first managing subsystem to said database subsystem,

Dr. Almeroth testified that the '537 DI Products satisfy this element for the same reasons set forth above with respect to the "management request" limitation of claim 19. CX-0007C (Almeroth WS) at Q/A 282-285, Q/A 295-307, Q/A 315; CX-0464; CX-0471C. Specifically, the claim limitation "indicating router configuration data for which said first managing subsystem is requesting to provide external management services" is satisfied because a process registers as a

SysDB EDM by "identif[ying] an item or subtree of the SysDB namespace for which it will act as the EDM." CX-0007C (Almeroth WS) at Q/A 286; CX-0471C at 15-47.

d. said registration request indicating router configuration data for which said first managing subsystem is requesting to provide external management services,

Cisco adduced evidence establishing that the '537 DI Products practice this limitation for the same reasons set forth above with respect to the "management request" limitation of claim 19. CX-0007C (Almeroth WS) at Q/A 286; CX-0471C at 15-47. The limitation "indicating router configuration data for which said first managing subsystem is requesting to provide external management services" is satisfied because a process registers as a SysDB EDM by "identif[ying] an item or subtree of the SysDB namespace for which it will act as the EDM." CX-0007C (Almeroth WS) at Q/A 286; CX-0471C at 15-47. Further, the requirement that the registration request indicate "router configuration data" is met under the adopted claim constructions for the same reasons set forth above with respect to claim 19. CX-0007C (Almeroth WS) at Q/A 286.

e. said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database;

The record evidence demonstrates that the '537 DI products practice this limitation under the adopted claim constructions. In particular, Dr. Almeroth testified that the claimed router configuration data is "managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database" for the reasons set forth with respect to claim 19 above. CX-007C (Almeroth WS) at Q/A 326-333; CX-0464; CX-0471C.

f. b) receiving said management registration request by said database subsystem;

Dr. Almeroth testified that, in Cisco's IOS XR, the agents send the request to serve as an EDM to SysDB. CX-0007C (Almeroth WS) at Q/A 285-286, Q/A 320-324; CX-0471C at 15-5; CX-0464. The part of SysDB that receives the mount request in order to perform the mount is the "database subsystem." *See* CX-0007C (Almeroth WS) at Q/A 285-286, Q/A 290-292, Q/A 320-324. Accordingly, it is determined that the '537 DI Products practice this limitation.

g. and c) registering said first managing subsystem for external management by said database subsystem.

Dr. Almeroth testified that the '537 DI Products practice this limitation. Specifically, he testified that, in Cisco's IOS XR, the agents send the request to serve as an EDM to SysDB. CX-0007C (Almeroth WS) at Q/A 285-286, Q/A 320-324; CX-0471C at 15-5; CX-0464. The part of SysDB that receives the mount request in order to perform the mount is the "database subsystem." *See* CX-0007C (Almeroth WS) at Q/A 285-286, Q/A 320-324.

3. Claim 2

a. The method of claim 1 further comprising

As set forth above, the record evidence shows that the '537 DI Products satisfy the limitations of claim 1.

b. maintaining router configuration data using a tree structure having a plurality of tuples by said database system.

As Dr. Almeroth testified, SysDB stores information in a tree format, one of the described embodiments for the database. CX-0007C (Almeroth WS) at Q/A 373; CX-0471C at 15-2; CX-0464 at 46.

It is therefore determined that the '537 DI products satisfy the limitations of claim 2.

4. Claim 8

a. The method of claim 1 further comprising:

As set forth above, the record evidence shows that the '537 DI Products satisfy the limitations of claim 1.

b. (a) transmitting a change request for router data by a requesting subsystem to said database subsystem;

The evidence shows that the accused products satisfy this limitation. As Dr. Almeroth testified, the '537 DI Products transmit a change request for router data by a requesting subsystem to said database subsystem. CX-0007C (Almeroth WS) at Q/A 378-383. As explained above, when a process wants to make a change to data, it sends that change request to SysDB. *See id.*

c. (b) receiving said change request by said database subsystem;

Dr. Almeroth testified that Sysdb receives the change request identified above. CX-0007C (Almeroth WS) at Q/A 378-383. This limitation is therefore satisfied by the '537 DI Products.

d. (c) determining whether said router data is externally managed by a second managing subsystem; and

The evidence establishes that the '537 DI Products satisfy this claim limitation. Dr. Almeroth testified that Sysdb determines whether the router data to be changed is externally managed by a second managing subsystem. CX-0007C (Almeroth WS) at Q/A 378-383. Inasmuch as there is no requirement that the "second managing subsystem" manage the same data as the "first managing subsystem," the first managing subsystem (*e.g.*, the STP process) serves as EDM for STP data, and a second managing subsystem (*e.g.*, the OSPF process) serves as EDM for OSPF data. CX-0007C (Almeroth WS) at Q/A 378-383. When a change is requested for that OSPF data by the claimed "requesting subsystem," Sysdb checks whether that data is externally managed and learns that it is externally managed by the OSPF process, *i.e.*, the "second managing subsystem." *See* CX-0464; CX-0471C.

e. (d) requesting a data change for said router data to said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem.

Dr. Almeroth testified that the claim limitation is satisfied because, when an EDM manages data, SysDB "redirects" the change request to the EDM so that the EDM carries out the change request as described above. CX-0007C (Almeroth WS) at Q/A 378-383.

5. Claim 10

Asserted claim 10 of the '537 patent is nearly identical to asserted claim 1, with the exception of the claim terms "program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine" and "registering said first managing subsystem for external management by said managing subsystem." The evidence shows that the '537 DI Products contain the claimed "program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine." *See* CX-0465 at 5; CX-0464. Further, processes within IOS XR register for external management by sending a registration request to SysDB and additionally by performing some related tasks after SysDB receives the registration request. CX-0007C (Almeroth WS) at Q/A 294, Q/A 299.

Therefore, for these reasons and the reasons discussed above with respect to claim 1, it is determined that the '537 DI Products satisfy all limitations of claim 10.

6. Claim 11

Claim 11 depends from claim 10, and recites an additional limitation that is identical to a limitation recited in claim 2. Inasmuch as the '537 DI Products practice the limitations of claims 10 and 2, they also practice the limitations of claim 11.

7. Claim 17

Claim 17 depends from claim 10, and recites additional limitations that are identical to limitations recited in claim 8. Inasmuch as the '537 DI Products practice the limitations of claims 10 and 8, they also practice the limitations of claim 17.

E. Validity

Arista relies on certain prior art references to argue that the asserted claims of the '537 patent are invalid. While there are several differences between the references and combinations, none of the cited prior art shows external management, a requirement of all the claims of the '537 patent. Instead, as discussed further below, each reference relies on some sort of centralized management.

For example, the concept of external management does not appear anywhere in Kathail '752 or Kathail '723. Prager '918 similarly discloses a system where a centralized manager machine manages the data and provides updates to remote subscribers. Hendrickson '646 discloses a centralized configuration database that provides updates to a set of software components. Moreover, Traversat '715 discloses a centralized management server that provides data to client devices.

1. Anticipation

a. U.S. Patent No. 5,838,918 ("Prager '918")

Prager '918 involves a manager machine with a central configuration database that communicates with remote subscriber machines. As an initial matter, Arista's expert does not address the requirement in all asserted claims that the router configuration data be "derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database." *See* RX-3273 (Hollingsworth WS) at Q/A 113-119. This omission is fatal to Arista's allegation of anticipation. Further, as Dr. Almeroth testified, Prager '918 discloses a fundamentally different system from the '537 patent. CX-1217C (Almeroth WS) at Q/A 102-103. In particular, Prager '918 does not disclose externally managing data by a subsystem. Rather, the "management" described in Prager '918 is carried out by the "manager machine." RX-3278 (Prager '918) at Fig. 4. Subscribers do not manage the data, but instead store data and receive updates from the central database, similar to the prior art centralized-management systems distinguished by the '537 patent. *Id.* at col. 6, lns. 30-39; CX-1217C (Almeroth RWS) at Q/A 105. Prager '918 similarly fails to disclose a "management registration request," inasmuch as devices only send subscription requests to receive data, not manage it. Prager '918 also does not teach or render obvious "router configuration data" under any party's construction. Prager '918 describes a distributed computer system, not routers, switches, bridges, or other networking equipment. CX-1217C (Almeroth RWS) at Q/A 111; RX-3278 at Figs. 1-4. As Dr. Almeroth testified, switches, bridges, routers, and other networking devices are very different from the types of devices shown in Prager '918. CX-1217C (Almeroth RWS) at Q/A 111. Moreover, storing data at subscriber machines as taught by Prager '918 does not relieve any of the computational burden of the centralized database. CX-1217C (Almeroth RWS) at Q/A 107.

b. U.S. Patent No. 6,704,752 ("Kathail '752")

Kathail '752 is one of named inventor Mr. Kathail's prior art patents regarding the use of a centralized database to manage data. The abstract of Kathail '752 confirms that it relates to management by a centralized database: "The centralized database system manages a storage structure (database tree) having a plurality of tuple nodes, where each tuple node contains configuration data for the router." RX-3282 (Kathail '752) at Abstract. The concept of external management, a key concept on the '537 patent, does not appear in Kathail '752. Indeed, the '537 patent distinguishes the '752 patent in the background of the invention section. JX-0001 ('537 patent) at col. 2, lns. 42-60. The '537 patent explains that its invention is designed to overcome drawbacks associated with the centralized management provided with prior systems such as Kathail '752. *Id.*

Nevertheless, Arista takes the position that Mr. Kathail's prior patents disclose external management. First, Arista argues that Kathail '752 "teaches the use of external data stores, which are used to maintain data outside of the centralized database," and that "[a] tuple in the centralized database sysDB may include a pointer that points to an external data store which contains the value for the tuple." *See* RX-3273C (Hollingsworth WS) at Q/A 201. As Dr. Almeroth testified, this excerpt does not teach external management, but rather describes an extension to SysDB such as additional memory space that operates as if it were part of SysDB. CX-1217C (Almeroth RWS) at Q/A 142-145. In particular, auxiliary storage space that is used by SysDB is not enough to show external management by a managing subsystem because external management in the '537 patent involves more than storing data. *Id.*

Arista also argues that "a subsystem may store a local copy of the configuration data locally within the subsystem and periodically check the sysDB 26 for current information." *See* RX-3273C (Hollingsworth WS) at Q/A 201. This argument fails for the reason discussed above, that external storage is not external management. In Kathail '752, the centralized database manages the data and transactions on the data, not on an external subsystem. CX-1217C (Almeroth RWS) at Q/A 142-145.

Arista's expert Dr. Hollingsworth also cites the portion of Kathail '752 discussing the use of a verification handler to support Arista's anticipation argument. *See* RX-3273C (Hollingsworth WS) at Q/A 201 (citing CX-1150 at col. 13, lns. 25-40). The '537 patent, however, explicitly discusses verification handling in the background, thereby distinguishing it from external management. JX-0001 ('537 patent) at col. 2, ln. 58 – col. 3, ln. 2. Other portions of the '537 patent also distinguish verification from external management. *See, e.g.*, *id.* at Fig. 8 (calling a verification handler in box 460 regardless of whether the data is externally managed); CX-1217C (Almeroth RWS) at Q/A 142–145.

c. U.S. Patent No. 6,728,723 ("Kathail '723")

Kathail '723 is also a prior art patent of named inventor of Mr. Kathail. It concerns a centralized database that manages data. Arista's anticipation arguments for Kathail '723 are similar to its anticipation arguments for Kathail '752, and must fail for the same reasons discussed above. CX-1217C (Almeroth RWS) at Q/A 158-177. In particular, the '537 patent discusses the external verifications of Kathail '723 in the background, and distinguishes those external verifications from external management. JX-0001 ('537 patent) at col. 2, ln. 58 – col. 3, ln. 2; col. 3, lns. 13-19.

d. U.S. Patent No. 5,933,646 ("Hendrickson '646")

Hendrickson '646 discloses a central "software manager" that uses a central configuration database to manage various software components on a system. RX-3276 (Hendrickson '646) at Abstract. The software components communicate with the software manager server using plug-in modules. *Id.* at col. 6, lns. 8-12. No management is done by the external software components or plug-ins. CX-1217C (Almeroth RWS) at Q/A 179-183. Instead, the central software manager is responsible for maintaining the central configuration database, and the software components receive information and updates through plug-ins. *Id.* For example, the software manager server carries out the functions to change the data, as was done in the prior art discussed in the background of the '537 patent. RX-3276 at col. 6, lns. 15-18; col. 8, lns. 29-30. Hendrickson '646 also does not teach or render obvious "router configuration data" under any party's construction. The system described in Hendrickson '646 is directed at a software manager, and not routers, switches, bridges, or other networking equipment. CX-1217C (Almeroth RWS) at Q/A 190.

Arista also uses Hendrickson '646 in combination with other references to argue that the asserted '537 claims are rendered obvious. As with Prager '918, however, the words "router," "switch," "bridge," and "networking" are not found in Hendrickson '646. As such, the discussion of computer systems in Hendrickson '646, without any specific discussion of networking devices, would not teach or render obvious to one of ordinary skill in the art that the system of Hendrickson '646 could be applied to routers. *Id.* Further, as with Prager '918, Arista fails to explain how Hendrickson '646 discloses router configuration data "derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database." *See* RX-3273 (Hollingsworth WS) at Q/A 323-329. Without such analysis, Arista cannot meet its burden to show invalidity.

2. Obviousness

a. NSFNET in Combination with Prager '918, Hendrickson '646, or Traversat '715

Arista argues that the combination of NSFNET with Prager, Hendrickson, or Traversat satisfies the router configuration data element. NSFNET is a report regarding the NSFNET network research project that designed and studied a backbone network infrastructure linking NSF-sponsored supercomputing centers. RX-3284. As Dr. Almeroth testified, a person of ordinary skill would not have been motivated to combine NSFNET with the references listed above solely because NSFNET discusses routers. CX-1217C (Almeroth RWS) at Q/A 114-117, Q/A 208-210, Q/A 252-254. Moreover, as discussed above with respect to Arista's anticipation arguments, the combinations each lack external management, router configuration data derived from commands, a management registration request, and reducing computational overhead.

b. Ciscon '010 in Combination with Prager '918, Hendrickson '646, or Traversat '715

Arista argues that the combination of Ciscon '010 with Prager, Hendrickson, or Traversat satisfies the router configuration data element. Ciscon '010 is a patent relating to techniques for handling data in a distributed computer network, where a router process runs on each computer in the network. RX-3275. Ciscon '010 was considered by the examiner during prosecution of the '537 patent. JX-0007. As Dr. Almeroth testified, a person of ordinary skill in the art would not have been motivated to combine Ciscon with the references listed above solely because Ciscon discusses routers. CX-1217C (Almeroth RWS) at Q/A 118-121, Q/A 211-213, Q/A 255-257. Moreover, as discussed above with respect to Arista's anticipation arguments, the combinations each still lack external management, configuration data derived from commands, and reducing computational overhead, and a management registration request.

c. Brodersen '752 in Combination with Hendrickson '646 or Traversat '715

Arista argues that the combination of Brodersen '752 with Hendrickson or Traversat satisfies the external management element, and in combination with Traversat satisfies the alleged reducing computational overhead requirement. Brodersen '752 describes a system for collecting, storing and retrieving data that uses a centralized database management scheme. RX-3286. It discusses a "master database server" or "central database" in conjunction with several "computer systems." *Id.* at Abstract; Figs. 9, 4-9. Brodersen does not describe operation of subsystems within a single router operating system running on a single device. RX-3286 at Abstract; Figs. 1-10, 1-31. It is also therefore incompatible with Hendrickson '646, which concerns an operating system. In any event, Arista does not identify why one of ordinary skill would have combined these references, when there are numerous ways to handle router configuration data, both with and without a centralized database. *See* CX-1217C (Almeroth RWS) at Q/A 193-199, Q/A 239-244. Moreover, as discussed above with respect to Arista's anticipation arguments, the combinations each still lack router configuration data, configuration commands, a management registration request, reducing computational overhead (in the Hendrickson combination), and a plurality of subsystems (in the Traversat combination).

d. James '977 in Combination with Hendrickson '646 or Traversat '715

Arista argues that the combination of James '977 with Hendrickson or Traversat satisfies the external management element, and in combination with Traversat satisfies the alleged reducing computational overhead requirement. James '977 describes a "master database" managed by a central server, and caching data stored there in various separate client devices involving the use of time stamps. RX-3285. James does not describe operation of subsystems within a single router operating system running on a single device. *Id.* It is also therefore incompatible with Hendrickson '646, which concerns an operating system on a computer. In any event, Arista does not identify why one of ordinary skill would have combined these references, when there are numerous ways to handle router configuration data, both with and without a centralized configuration database. *See* CX-1217C (Almeroth RWS) at Q/A 200-207, Q/A 245-250. Moreover, as discussed above with respect to Arista's anticipation arguments, the combinations each still lack router configuration data, configuration commands, a management registration request, reducing computational overhead (in the Hendrickson combination), and a plurality of subsystems (in the Traversat combination).

e. Prager '918 in Combination with Traversat '715 – Claims 2 and 11

Arista further argues that Prager '918 can be combined with Traversat '715 for the limitation in claims 2 and 11 regarding the use of a tree structure. As Dr. Almeroth testified, there are numerous different types of data structures that can be used (*e.g.*, trees, tables, pointers, lists, records, queues, etc.), and Arista's expert Dr. Hollingsworth has not provided any reason to explain why one of ordinary skill would have combined Prager '918 with Traversat '715. CX-1217C (Almeroth RWS) at Q/A 126-129. In any event, even if these references were combined, they still do not address the numerous deficiencies with Prager '918 identified above.[26]

[26] The Joint Outline of Issues specifies that one of the issues to be decided in this initial determination is "[w]hether Complainant has met its burden to demonstrate any secondary considerations of nonobviousness for any asserted claim of the '537 patent," and identifies pages

3. Arguments Relating to 35 U.S.C. § 112

a. Indefiniteness – Claims 1 and 10

For the reasons stated in the claim construction section above, the term "said database" in claims 1 and 10 is not indefinite.[27] In particular, Dr. Almeroth's testimony confirms that a person of ordinary skill in the art would be informed with reasonable certainly that the claim term "said database" recited in claims 1 and 10 refers to the "database system." *See* CX-0007C (Almeroth WS) at Q/A 78, Q/A 81; *see also* Hollingsworth Tr. 1040-1041.

b. Written Description and Enablement – Claims 8, 9, 17, and 18

Arista's expert Dr. Hollingsworth has taken the position that claims 8, 9, 17, and 18 are invalid for failure to satisfy the written description and enablement requirements because the '537 patent "never discloses how two 'managing subsystems'—namely the first management subsystem and the second managing subsystem—can concurrently externally manage the same data." *See* RX-3273C (Hollingsworth WS) at Q/A 355. This argument is incorrect for several reasons.

First, this invalidity argument relies on the assumption that two managing subsystems externally manage the same data. This assumption is incorrect because it is inconsistent with the claims and specification of the '537 patent, as well as the understanding of one of ordinary skill in the art. In particular, nothing in the claim language refers to two managing subsystems externally managing the same data. CX-1217C (Almeroth RWS) at Q/A 279-282. Instead,

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135-45 of complainant's post-hearing brief as addressing this issue. Joint Outline of Issues at 5. Yet, complainant's brief does not contain arguments regarding secondary considerations of nonobviousness with respect to the '537 patent, and they will not be addressed in this initial determination.

[27] Asserted claims 2, 8, 9, 11, 17, and 18 depend from claims 1 and 10, and are not indefinite for the reasons set forth with respect to claims 1 and 10.

claims 8 and 17 describe how a requesting subsystem transmits a change request to the database subsystem. The database subsystem will then determine whether the requesting subsystem is requesting data externally managed by another subsystem. JX-0001 ('537 patent) at claim 8. This process is illustrated in detail in Figure 8 of the '537 patent, and is described in the associated section of the specification. *Id.* at Fig. 8; col. 13, ln. 48 – col. 15, ln. 11. As such, it is determined that claims, 8, 9, 17, and 18 are both supported by the written description and enabled. *See* CX-1217C (Almeroth RWS) at Q/A 279-282.

Second, the claims are enabled and described by the specification at column 13, line 48 through column 15, line 11. The claims are also illustrated in Figure 8. As Dr. Almeroth testified, a person of skill in the art would be able to use the teaching of the '537 patent and enable external monitoring of the same attribute in selected situations without undue experimentation. CX-1217C (Almeroth RWS) Q/A 279-282. For example, Arista's own documentation demonstrates techniques by which this can be accomplished. CX-0435C.

Therefore, it is determined that claims 8, 9, and 17 are not invalid for failure to satisfy the written description and enablement requirements of 35 U.S.C. § 112.

4. Inventorship

Arista argues that the asserted claims of the '537 patent are invalid for failing to list Mr. Andrew Valencia as an inventor. The record evidence establishes, however, that Mr. Kathail is the sole inventor of the '537 patent.

In support of its inventorship position, Arista identifies Mr. Valencia's involvement in creating the centralized database in the prior art Cisco patents. Nevertheless, Arista has not adduced evidence to establish that Mr. Valencia ever conceived of external management of router configuration data, which is the claimed invention of the '537 patent. Indeed, Mr. Valencia testified that he had never heard of the concept of external data management:

> Q. Have you ever heard of the concept of a term called "EDMs" or "external data managers" when used with respect to SysDB?
>
> A. That sounds completely unfamiliar in the context of SysDB.

JX-0038C (Valencia Dep. Tr.) 41.

Mr. Valencia's involvement in the development of the centralized database does not warrant the conclusion that he should be named as an inventor on the '537 patent, inasmuch as the evidence does not show that he made a significant contribution to the conception of one or more of the claims of the patent. *See Eli Lilly and Co. v. Aradigm Corp.*, 376 F.3d 1352, 1358-59 (Fed. Cir. 2004). Instead, the evidence adduced by Arista shows that Mr. Valencia and Mr. Kathail worked together on the concept of a centralized database to manage data in an operating system of a network device, a concept that is claimed in U.S. Patent Nos. 6,704,752, 6,952,703, and 6,728,723. *See* JX-0038C (Valencia Dep. Tr.) at 41. Accordingly, Mr. Valencia was properly named as a co-inventor on these patents, which are prior art to the '537 patent. By contrast, the invention claimed in the '537 is external management of the centralized database, to which Mr. Valencia did not contribute significantly. Thus, it is determined that the '537 patent is not invalid for failure to name the correct inventors.

VI. The '597 (ProcMgr) Patent

A. Claim Construction

1. Level of Ordinary Skill

Cisco's expert testified that a person of ordinary skill in the art at the time of invention of the '597 patent would have at least a Bachelor of Science degree, or its equivalent, in electrical engineering, computer engineering, computer science, or a related field and either a Master of

Science degree, or its equivalent, in one of those fields or approximately two years of related experience in the field of network devices. *See* CX-0001C (Wicker WS) at Q/A 29.

Arista's expert testified that a person of ordinary skill in the art would have an undergraduate degree in computer science, computer engineering, electrical engineering, or a closely related field, along with at least 2-3 years of experience working in the field of computer networks and systems. In addition, superior education or work experience could compensate for a deficiency in the other. *See* RX-3273C (Hollingsworth WS) at Q/A 361-363.

Both experts for Cisco and Arista agree that a person of ordinary skill in the art would have at least an undergraduate degree in computer science, computer engineering, electrical engineering, or a related field.

Cisco's expert also opines that a person of ordinary skill in the art would have a Master of Science degree, an additional requirement that could be satisfied with two years of experience in a relevant field. This is consistent with the opinion of Arista's expert that a person of ordinary skill in the art would have 2-3 years of experience in a relevant field. The experts' proposals differ in the particular field in which that experience should be gained. Cisco's expert proposes the field of "network devices," whereas Arista's expert proposes the field of "computer networks and systems."

In view of the expert testimony, it is determined that a person having ordinary skill in the art of the '597 patent is a person with a Bachelor of Science degree in computer science, computer engineering, electrical engineering, or a closely related field, along with at least 2-3 years of experience working in the field of network devices or computer networks and systems.

2. Disputed Claim Terms

a. "a change to a configuration" (claim 1) / "a change in configuration" (claims 39 and 71)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "a change to the state of the device"	a change to the settings of the subsystem specified by the user	No construction necessary. The Staff 's original proposed construction, if construction is necessary, was "a change to the state of the device." The Staff 's revised construction is "a change to the settings of the subsystem"

The claim term "a change to a configuration" is recited in asserted claim 1 of the '597 patent, and the claim term "a change in configuration" is recited in asserted claims 39 and 71. As proposed by the Cisco, the terms "a change to a configuration" and "a change in configuration" are construed to mean "a change to the state of the device," a construction that reflects the ordinary meaning of the term as understood by a person having ordinary skill in the art.

Cisco's expert Dr. Wicker testified that the phrases "a change to a configuration" and "a change in a configuration" are plain terms that are easily understood by one of ordinary skill in the art in light of the claims and specification. CX-0001C (Wicker WS) at Q/A 67. In particular, including because the '597 patent is generally directed at an invention for increasing the security of a device, a person of ordinary skill in the art would understand the patent's detected configuration changes to encompass changes related to "any compromise" of a device. CX-0001C (Wicker WS) at Q/A 67-70; JX-0004 ('597 patent) at col. 3, lns. 63-66. For example, the patent describes the logging module detecting software modifications, anomalous conditions, hardware resets, user interaction through the command line interface, and the changes made by the device itself, such as a device setting its own source IP and MAC address. JX-0004 ('597 patent) at col. 1, lns. 30-33; col. 14, lns. 52-54; col. 4, lns. 35-38; col. 9, lns. 18-21; col. 5, lns. 33-36. Indeed, the '597 patent uses the term "state" and "configuration" interchangeably, indicating that the term "configuration" is used broadly to encompass the state of the device. CX-0001C (Wicker WS) at Q/A 68; JX-0004 ('597 patent) at col. 13, ln. 50 – col. 14, ln. 10; col. 11, ln. 60 – col. 12, ln. 6. For example, the patent explains that reset of a network device is a reset to a predetermined known "state" or "configuration":

> At step 525, the network device is reset to a predetermined, "known" state. . . . At step 535, the security monitors receive the broadcast and determine that there has been a change in the network device's configuration and that the network device has been reset to a predetermined, known configuration.

JX-0004 ('597 patent) at col. 11, ln. 60 – col. 12, ln. 4.

Moreover, the patent explains that the reset of a device, *i.e.*, a reset to a "predetermined, known state," "should be logged as a configuration change." JX-0004 ('597 patent) at col. 4, lns. 35-38; col. 11, ln. 60 – col. 12, ln. 4. Thus, as Dr. Wicker explained, a person of ordinary skill in the art would understand the '597 patent's use of the term "configuration" to broadly encompass the state of the claimed communication device. *See* CX-0001C (Wicker WS) at Q/A 67; Wicker Tr. 322-326. Therefore, the patent's use of "configuration" broadly encompasses all types of changes to a variety of different aspects of the device.

In contrast, Arista's proposed construction narrows the term "configuration" to "settings . . . specified by [a] user," a modification that is not supported by the intrinsic evidence. In particular, the term "settings" does not appear in the '597 patent or file history. Further, as Dr. Wicker testified, a person of ordinary skill in the art would not restrict "configuration" to "settings" in the context of the '597 patent because nothing in the intrinsic record supports limiting the claim scope in such a way. CX-0001C (Wicker WS) at Q/A 73.

The second part of Arista's proposed construction, which limits the changes that can be detected to those specified by a "user," also does not comport with the intrinsic evidence. *See* CX-0001C (Wicker WS) at Q/A 73-75. In particular, the '597 patent specification discloses embodiments where configuration changes are made by the network device itself, rather than by a user. For example, the specification describes situations in which the device itself changes its own IP and MAC address, thereby triggering a log entry and a potential security event. JX-0004 ('597 patent) at col. 5, lns. 33-36; CX-0001C (Wicker WS) at Q/A 73-75. Other configuration changes, such as hardware resets, are also accomplished without being specified by a user. JX-0004 ('597 patent) at col. 4, lns. 35-38; CX-0001C (Wicker WS) at Q/A 73. Moreover, inasmuch as a stated goal of the '597 patent is to alert an administrator when a communications device is compromised by an attacker, the detected "configuration" changes naturally should include any type of attack, not merely changes to a device's "settings" specified by a user. CX-0001C (Wicker WS) at Q/A 73; *see* JX-0004 ('597 patent) at col. 3 lns. 63-66.

b. "a logging module" (claims 1 and 39)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "a module configured to detect changes"	A module to generate a log record	"a module configured to detect changes"

The claim term "a logging module" is recited in asserted claims 1 and 39 of the '597 patent. Cisco originally proposed a construction of "a module configured to detect changes," a construction also proposed by the Staff. *See* Staff Br. at 51-52. Subsequently, Cisco stated in its post-hearing brief:

> Although the parties initially disputed this construction, it is no longer relevant to any claim or defense. Thus, while Cisco agrees that Staff's construction appropriately captures that the "logging module" be "configured to detect changes," Cisco will adopt Arista's construction of "a module to generate a log record" to streamline the investigation.

Compl. Br. at 153.

The claim term "a logging module" is therefore construed to mean "a module to generate a log record," a construction that is supported by the patent specification. For example, in describing Figure 1, the specification states: "Logging module 120 determines a configuration of the subsystem 115, detects a change in the configuration of the subsystem 114 and indicates that the change has occurred." JX-0004 ('597 patent) at col. 6, lns. 7-10.

c. "a logging module, coupled to said subsystem" (claim 1) / "a logging module is coupled to said subsystem" (claim 39)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "a logging module operably connected to said subsystem" / "a logging module is operably connected to said subsystem"	a logging module connected to the subsystem without using a central storage location	No construction necessary. If construction is necessary, "a logging module connected to said subsystem" / "a logging module is connected to said subsystem"

The claim term "a logging module, coupled to a said subsystem" is recited in asserted claim 1 of the '597 patent, and the related term "a logging module is coupled to said subsystem" is recited in asserted claim 39. The evidence demonstrates that the meaning of these terms is clear to a person having ordinary skill in the art, and that they do not need further construction.

To the extent construction of these related terms is necessary, intrinsic evidence supports a construction of "a logging module connected to said subsystem" / "a logging module is connected to said subsystem." For example, Figure 1 of the '597 patent shows a logging module connected to a subsystem and the patent shows no evidence of redefining the words. JX-004 ('597 patent) at Fig. 1.

As Dr. Wicker testified, the phrase "coupled to said subsystem" is easily understood by a person of skill in the art of the '597 patent in light of the claims and specification. CX-1216C (Wicker RWS) at Q/A 51; Wicker Tr. 371-372. In particular, a person having ordinary skill would understand from reading the specification that two components can be "coupled" to each other despite the presence of "intermediate components":

> The foregoing described embodiment wherein the different components are contained within different other components (e.g., the various elements shown as components of communications device 100). It is to be understood that such depicted architectures are merely examples, and that in fact many other architectures can be implemented which achieve the same functionality. In an abstract, but still definite sense, any arrangement of components to achieve the same functionality is effectively "associated" such that the desired functionality is achieved. Hence, any two components herein combined to achieve a particular functionality can be seen as "associated with" each other such that the desired functionality is achieved, irrespective of architectures or intermediate components. Likewise, any two components so associated can also be viewed as being "operably connected," or "operably coupled," to each other to achieve the desired functionality.

JX-0004 ('597 patent) at col. 6, lns. 35-51; *see* Hollingsworth Tr. 1278; CX-1216C (Wicker RWS) at Q/A 51.

d. "broadcasting" (claims 29, 63, and 64) / "broadcast" (claim 73)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
"transmitting data to one or more devices without specifying what device(s) will ultimately receive the data"	"transmitting/transmission to one or more receivers"	No construction necessary. If construction is necessary, "transmitting/transmission to one or more receivers"

The claim term "broadcasting" is recited in asserted claims 29, 63, and 64 of the '597 patent, and the related claim term "broadcast" is recited in asserted claim 73. As proposed by Arista, the terms "broadcasting" and "broadcast" are construed to mean "transmitting to one or more receivers" and "transmission to one or more receivers," respectively. This construction is consistent with the intrinsic evidence, and is also supported by the Staff. *See* Staff Br. at 53-54.

Specifically, according to the patent specification, a broadcast occurs when information is sent to one or more devices. JX-0004 ('597 patent) at col. 7, lns. 38-42; col. 11, lns. 46-51; col. 11, lns. 64-67.

B. Literal Infringement Analysis

As discussed in further detail below, the evidence adduced at the hearing fails to show that the Accused '597 Products infringe the asserted claims of the '597 patent.

Specifically none of the Accused '597 Products infringe asserted independent claims 1, 39, and 71 because they do not satisfy the "detect a change to a configuration of said subsystem claim limitation." Inasmuch as the asserted dependent claims all depend from claims 1, 39, 71, none of Accused '597 Products infringe the dependent claims for the same reason.

In addition, none of the Accused '597 Products infringe dependent claim 72 because they do not satisfy the "determine the configuration" claim limitation.[28]

1. The Accused Products Do Not Detect a Change to a Configuration of a Subsystem

Asserted claim 1 requires that the logging module "detect a change to a configuration of said subsystem." JX-0004 ('597 patent) at col. 16, lns. 49-50. Similarly, asserted claims 39 and 71, the other two independent claims at issue, recite "detect/[ing] a change in a configuration of a subsystem." As discussed above, these claim terms are construed to mean "a change to the state of the device." The evidence shows that the accused Arista products do not detect a change in configuration under the adopted construction of that term.

At the hearing, Cisco's expert Dr. Wicker testified that he identifies three mechanisms within ProcMgr as satisfying the limitation of detecting a change in configuration. Wicker Tr. at 257-258. Specifically, these mechanisms are: [

]. CX-0001C (Wicker WS) at Q/A 113. The three mechanisms were illustrated during Dr. Wicker's testimony, and this illustration is reproduced below:

[28] Inasmuch as the accused products do not literally infringe the '597 patent, there can be no finding that Arista is liable for indirect infringement of the '597 patent.

[

]

RDX-1001C (red numerals added).

None of these three mechanisms satisfies the limitation of detecting a change in configuration. The evidence shows that, regardless of the mechanism, ProcMgr [ ]. RX-3912C (Duda RWS) at Q/A 49-50. [ ]. *Id.* Moreover, ProcMgr, by design, [ ]. *Id.* Indeed, the evidence demonstrates that ProcMgr [ ]. *Id.* at Q/A 51. In addition, [ ]. *Id.* [ ]. *Id.* Further, [ ]. *Id.* at Q52-53. [

]. *Id.* at Q54. Instead, [

]. *Id.*

a. [ ] Do Not "Detec[t] a Change in Configuration"

[ ] are related and work together to monitor for agent failures. Wicker Tr. 265. As Dr. Wicker testified, [ ]. Wicker Tr. 258-259, 261, 279. [ ]. Wicker Tr. 259, 280; RX-3912C (Duda RWS) at Q/A 43. [ ]. RX-3912C (Duda RWS) at Q/A 43. [ ]. *Id.* at Q/A 43, Q/A 46-47; Wicker Tr. 262-265.

ProcMgr's [ ] does not constitute detecting whether the agent's configuration has changed as claimed in the '597 patent. RX-3912C (Duda RWS) at Q/A 8, Q/A 46-47, Q/A 50-53; Hollingsworth Tr. 1285-1286. Instead, it constitutes ProcMgr [ ]. RX-3912C (Duda RWS) at Q/A 8, Q/A 46-47, Q/A 50-53; *see* Hollingsworth Tr. 1285-1286.

b. [ ] Does Not Detect a Change to a Subsystem

Contrary to Cisco's infringement arguments, the evidence shows that ProcMgr does not satisfy the "detect a change to a configuration of said subsystem" claim limitation when it determines [ ]. *See* RX-3912C (Duda RWS) at Q/A 43, Q/A 50; RX-3909C (Hollingsworth RWS) at Q/A 245; Wicker Tr. 293-294. Indeed, the evidence demonstrates that the [ ]. RX-3912C (Duda RWS) at Q/A 43, Q/A 50; Hollingsworth Tr. 1272. Moreover, Cisco's' expert Dr. Wicker testified that the files in the [ ]. *See* CX-0001C (Wicker WS) at Q/A 125, Q/A 143-44.

Evidence adduced at the hearing establishes that the [ ]. RX-3912C (Duda RWS) at Q/A 43, 50; RX-3909C (Hollingsworth RWS) at Q/A 245; Wicker Tr. 293-294. [ ]. RX-3909C (Hollingsworth RWS) at Q/A 245; RDX-1123; CX-0001C (Wicker WS) at Q/A 128. For example, [ ]. Hollingsworth Tr. 1288-1289. That attribute, found in the [ ]. Hollingsworth Tr. 1283-1284. Rather, [ ]. *Id.* Therefore, to the extent ProcMgr [ ].

2. The Accused Arista Products Do Not Determine a Configuration (Claim 72)

Contrary to Cisco's arguments, the Accused '597 Products do not infringe claim 72 because they do not satisfy the claim limitation "determine the configuration." In particular, Cisco's expert Dr. Wicker testified that this limitation is satisfied because "[ ]." *See* Compl. Br. at 181-82; CX-0001C (Wicker WS) at Q/A 180.

The evidence shows, however, that ProcMgr does not determine the configuration of the identified subsystems, *i.e.*, agents. RX-3909C (Hollingsworth RWS) at Q/A 273; RX-3912C (Duda RWS) at Q/A 49-50. As above, [ ]. RX-3912C (Duda RWS) at Q/A 43, 5 Q/A 0; RX-3909C (Hollingsworth RWS) at Q/A 245, Q/A 273. [ ]. RX-3912C (Duda RWS) at Q/A 43; RX-3909C (Hollingsworth RWS) at Q/A 246, Q/A 273. Moreover, [ ]. RX-3909C (Hollingsworth RWS) at Q/A 255-261, Q/A 273. None of these functionalities is determining a change in configuration of an agent. *See* RX-3909C (Hollingsworth RWS) at Q273. Accordingly, the Accused '597 Products do not determine a configuration as required by claim 72.

C. Technical Prong of the Domestic Industry Requirement

At the hearing, Cisco offered evidence establishing that the technical prong of the domestic industry requirement is satisfied because the Catalyst 6500, Catalyst 6800, ASR 901, and Nexus 7000 Cisco products satisfy at least claims 1, 14-15, 39, and 71-72 of the '597 patent.

1. Claim 1

a. An apparatus comprising:

The record evidence demonstrates that each of the '597 DI Products is an apparatus. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 282; CX-0309 ("Catalyst 6500 Data Sheet"); CX-0312 ("Catalyst 6800 Data Sheet"); CX-0306 ("ASR 901 Data Sheet"); CX-0321 ("Nexus

7000 Data Sheet"); CX-0311 ("Catalyst 6800 Data Sheet"); CX-0310 ("Catalyst 6500 Data Sheet"); CX-0067 ("Nexus 7000 Data Sheet").

b. a communications device comprising:

The '597 DI Products satisfy this limitation because each is a communications device. Specifically, the '597 DI Products are routers and switches that are used in communications data networks. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 283; CX-0309 ("Catalyst 6500 Data Sheet"); CX-0312 ("Catalyst 6800 Data Sheet"); CX-0306 ("ASR 901 Data Sheet"); CX-0321 ("Nexus 7000 Data Sheet"); CX-0311 ("Catalyst 6800 Data Sheet"); CX-0310 ("Catalyst 6500 Data Sheet"); CX-0067 ("Nexus 7000 Data Sheet").

c. a subsystem;

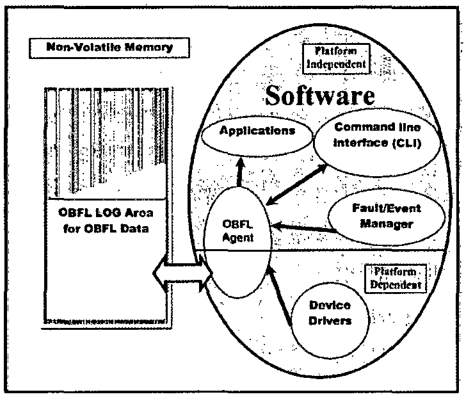
The evidence shows that the '597 DI Products are made up of numerous subsystems. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 284. As the '597 patent explains, the communications interface itself is a subsystem. JX-0004 ('597 patent) at Figs. 1, 2. Each of the '597 DI Products is a router or switch and thus, like the '597 patent, has a communications interface subsystem through which packets are sent, processed, and received. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 284. Further, OBFL detects and logs configuration changes for individual field replaceable units, or "FRUs." Thus, another subsystem is the set of components monitored on the particular FRU monitored by OBFL. CX-0001C (Wicker WS) at Q/A 284; CX-0355C (OBFL Architecture Document) at 005-8.

d. and a logging module, coupled to said subsystem, and configured to detect a change to a configuration of said subsystem of said communications device,

As discussed in further detail below, the evidence establishes that the '597 DI Products meet this element under all parties' constructions.

i. a logging module

Cisco has adduced evidence showing that the Cisco '597 DI Products meet this element under any party's construction. A generic diagram describing the OBFL architecture for IOS-based '597 DI Products (*i.e.*, Catalyst 6500, Catalyst 6800, ASR 901) is reproduced below:


Non-Volatile Memory
Platform Independent
Software
Applications
Command line Interface (CLI)
OBFL LOG Area for OBFL Data
OBFL Agent
Fault/Event Manager
Platform Dependent
Device Drivers

CX-0337C (OBFL Product Requirements Document, "PRD") at 805; *see also* CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293; CX-0298C ("Cat6k OBFL Design Specification").

The OBFL Agent or instance is responsible for all interactions with the non-volatile memory. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293. The OBFL Agent interacts with other software applications, such as the CLI, that require access to read or write from the non-volatile memory. *Id.* The OBFL Agent also interacts with platform dependent device drivers that provide platform-specific information, such as ASIC versions. *Id.* OBFL works similarly in NX-OS-based '597 DI Products (*i.e.*, Nexus 7000 series). CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293; CX-0357C (OBFL Specification) at 763.

OBFL is "configured to detect changes," as required by the Staff's (and Cisco's initial) construction for "logging module."[29] CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-95. Various types of critical information can be tracked by OBFL related to the device's subsystems, and if that information changes, such changes will be captured and logged. *Id.*; *see, e.g.*, CX-0337C (OBFL PRD) at 806-21. OBFL thus also "generates a log record" as required by Arista's (and Cisco's current) construction of "logging module." Types of information that may be detected and logged are summarized in the table in CX-0337C (OBFL PRD) at 806, and include OS Version, BIOS/Firmware Version, FPGA Version/Device ID, ASIC Version, Slot Number and Chassis Type, ASIC register dumps, Number of Resets and Uptime, and various other system messages. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293. In addition, certain platforms, such as the ASR 901, also log certain CLI configuration commands. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293; *see, e.g.*, CX-0305 (ASR 901 IOS Config Guide) at 598.

Information is logged on a field replaceable unit ("FRU") basis. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293; *see, e.g.*, CX-0337C (OBFL PRD). This means, depending on the platform-type, that OBFL instances may exist for an entire platform, on line cards, or on route processors and supervisors. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293; *see, e.g.*, CX-0337C (OBFL PRD) at 802; CX-0355C (OBFL Architecture Document) at 005-8. User control of the platform is typically through the main platform processor over the CLI. The user may interact with the various OBFL instances through the CLI to provide logged OBFL information to the user console. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293; *see,*

[29] Cisco agreed to Arista's construction of "logging module" to streamline the issues in this investigation. *See* Compl. Br. at 153.

e.g., CX-0355C (OBFL Architecture Document) at 005-8; CX-0337C (OBFL PRD) at 805, CX-0382 (IOS Configuration Guide); CX-0315 (IOS Configuration Guide); CX-0305 ("ASR 901 IOS Configuration Guide); CX-0320 (NX-OS Configuration Guide).

The generated log records are stored in physical non-volatile memory and persist through module resets, reloads, power cycles, and upgrades. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-95; *see also* CX-0337C (OBFL PRD) at 802; CPX-0002C (Cisco Source Code) at IOS \sys\obfl\ and NX-OS at \storage\common\uspace\obfl\, \storage\common\uspace\plog\, and \storage\common\diag2\. [

]. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293; *see, e.g.*, CX-0337C (OBFL PRD) at 804, 807. [

]. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-293; *see also* CX-0337C (OBFL PRD) at 823.

ii. a logging module, coupled to said subsystem

The evidenced adduced at the hearing shows that the Cisco '597 DI Products meet this element under all parties' constructions. As an initial matter, OBFL is connected or operably connected to the subsystem, satisfying Cisco's and the Staff's constructions. As described above, the OBFL software runs on the FRU it is monitoring and is therefore connected to the various subsystems, such as for example the ASIC drivers and device drivers. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-95; *see e.g.*, CX-0337C (OBFL PRD) at 802; CX-0355C (OBFL Architecture Document) at 5-8. Moreover, for the reasons discussed above with respect to Cisco and the Staff's constructions, the '597 DI Products also meet this limitation under Arista's construction because the OBFL software runs on the FRU it is monitoring and logs its

data to local non-volatile storage rather than a central storage location. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-95; *see e.g.*, CX-0337C (OBFL PRD) at 802; CX-0355C (OBFL Architecture Document) at 5-8.

iii. a logging module . . . configured to detect a change to a configuration of said subsystem of said communications device

It has been established that the Cisco '597 DI Products meet this element under all parties' constructions. Cisco's expert Dr. Wicker testified that at least the following items detected and logged by OBFL constitute "configuration" of a subsystem under all parties' constructions: OS Version, BIOS/Firmware Version, FPGA Version/Device ID, ASIC Version, Slot Number and Chassis Type, ASIC register dumps, Number of Resets and Uptime, and various other system messages. The '597 DI Products log various combinations of these types of information from the subsystems, and a change to these items in the system will be detected and logged by OBFL, as Dr. Wicker testified. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-95; *see, e.g.*, CX-0382 at 920-22, 924, 926-28; CX-0315 at 288-90, 292, 294-96; CX-0320 at 285, 288; CX-0357C at 765-70, 790-91.

Further, these categories of information logged by OBFL constitute "a change to the settings of the subsystem specified by a user" or "a change to the settings of the subsystem" as required by Arista's construction and the Staff's new construction. For example, a user can choose to upgrade or configure a system to change at least the OS Version, BIOS/Firmware Version, FPGA Version, or the content of ASIC register dumps. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 285-95. A user can also change or select which slot number a line card is plugged into in a chassis. *Id.* A user can also cause a reset of the system. *Id.* Thus, the '597 DI Products satisfy this limitation under all parties' constructions.

e. and communicate information regarding said change to said configuration of said subsystem of said communications device.

The evidence shows that the '597 DI Products satisfy this limitation by sending the logged information to the non-volatile memory as described above, and also by providing such information to the user through, for example, CLI commands. Various combinations of "show logging onboard" CLI commands will produce OBFL records to the user console. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 294-95; CX-0382 (IOS Configuration Guide); CX-0315 (IOS Configuration Guide); CX-0305 (ASR 901 IOS Configuration Guide); CX-0320 (NX-OS Configuration Guide).

2. Claim 14

a. The communications device of claim 1,

As discussed above, the '597 DI Products practice claim 1 of the '597 patent.

b. wherein the subsystem is a communications interface.

The evidence further shows that the '597 DI Products practice the claim element "the subsystem is a communications interface." As described above, the '597 DI Products are coupled and detect changes to the communications interface on Cisco's products. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 297-299. Thus, the '597 DI Products satisfy this limitation.

3. Claim 15

a. The communications device of claim 14,

As discussed above, the '597 DI Products practice claim 14 of the '597 patent.

b. wherein the logging module is further configured to restrict a change to a configuration of the logging module by the communications interface.

The evidence shows that the '597 DI Products practice the claim element "the logging module is further configured to restrict a change to a configuration of the logging module by the communications interface." Certain aspects of OBFL's configuration cannot be changed by the communications interface, and therefore the '597 DI Products satisfy this limitation. For example, [

]. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 294-95; CX-0337C (OBFL PRD) at 804, 807. [

]. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 294-95; CX-0337C (OBFL PRD) at 823; (CX-0357C (OBFL Specification) at 769-70. The user cannot stop this from happening through the communications interface. Thus, the '597 DI Products satisfy this limitation.

4. Claim 39

Independent claim 39 is a method claim with limitations that parallel those recited in independent apparatus claim 1. In particular, claim 39 reads as follows:

> 39. A method comprising: detecting a change in a configuration of a subsystem of a communications device wherein a logging module is coupled to said subsystem and said detecting is performed at the logging module; and communicating information regarding the change comprises causing said logging module to communicate the change information.

Cisco adduced evidence demonstrating that the '597 DI Products practice method claim 39. In particular, Dr. Wicker testified that the '597 DI Products are communications devices that perform a method. Moreover, the '597 DI Products practice the other limitations of this claim for the reasons discussed above with respect to claim 1. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 302-303.

5. **Claim 71**

a. **A communications device comprising:**

The evidence shows that the '597 DI Products satisfy this limitation because each is a communications device. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 310-311.

b. **a subsystem;**

The '597 DI Products satisfy this limitation for the reasons set forth above with respect to the parallel limitation of claim 1.

c. **a processor, coupled to the subsystem;**

Dr. Wicker testified that the '597 DI Products include the claimed processor for at least the reasons explained above with respect to the parallel limitation recited in claim 1. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 310-311.

d. **computer readable medium coupled to the processor;**

Dr. Wicker testified that the domestic industry products include "computer readable medium coupled to the processor" because, as described earlier, the operating system software including the OBFL feature will run in some runtime memory that is coupled to the processor. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 310-311; CX-0356C (OBFL Generic Software Functional Specification, "FS"); CX-0326 (Catalyst 6500 Comparison); CX-0383C (Cat 6800 FS); CX-0291C (ASR-901 HW Design Specification); CX-0353C (Nexus 7000 HW FS); CX-0295C (Nexus 7700 FS); CX-0359C (Cat6500 Card FS).

e. **and computer code, encoded in the computer readable medium, configured to cause the processor to:**

The record evidence shows that the '597 DI Products satisfy this limitation because the operating system software that includes OBFL will run in some runtime memory that is coupled to the processor described above. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 310-311;

CX-0356C (OBFL Generic Software FS); CX-0326 (Catalyst 6500 Comparison); CX-0383C (Cat 6800 FS); CX-0291C (ASR-901 HW Design Specification); CX-0353C (Nexus 7000 HW FS); CX-0295C (Nexus 7700 FS); CX-0359C (Cat6500 Card FS).

f. detect a change in a configuration of the subsystem;

The '597 DI Products practice this limitation for the reasons discussed above with respect to the parallel limitation recited in claim 1. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 302-303.

g. and communicate information regarding the change.

As Dr. Wicker testified, the '597 DI Products include OBFL, which is configured to cause the processor communicate information regarding the change for at least the reasons explained above with respect to the parallel limitation recited in claim 1. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 302-303.

6. Claim 72

a. The communications device of claim 71,

As discussed above, the '597 DI Products practice claim 71 of the '597 patent.

b. wherein the computer code is further configured to cause the processor to: determine the configuration.

The evidence shows that the '597 DI Products practice the additional claim 72 limitation "the computer code is further configured to cause the processor to: determine the configuration." As Dr. Wicker testified, the '597 DI Products satisfy this limitation because they determine what the changed configuration is. CX-0001C (Wicker WS) at Q/A 263-280, Q/A 312-313. For example, if a line card is put into a different chassis slot, OBFL will log which slot the line card is in. *See* CX-0337C at 812–13; CX-0382 at 926; CX-0315 at 294; CX-0357C at 766; CX-0320 at 289.

D. Validity

Cisco argues that the doctrine of assignor estoppel bars Arista from challenging the validity of the '597 patent in this investigation, an argument with which the Staff agrees. *See* Cisco Br. at 191-200; Staff Br. at 59-66. As set forth below, it is determined that assignor estoppel does serve as a bar to Arista's arguments that the asserted claims of the '597 patent are invalid over the prior art, or are directed to unpatentable subject matter. Nevertheless, Arista's invalidity arguments with respect to Sections 101, 102, and 103 of the Patent Act are also discussed below for the sake of completeness.

1. Assignor Estoppel

The assignor estoppel doctrine precludes the assignor of a patent (and those in privity with the assignor) from asserting at a later time that a patent previously assigned for consideration is invalid. The evidence adduced in this investigation demonstrates that assignor estoppel applies with respect to the '597 patent. Not only did named inventor Dr. Cheriton make a valid assignment of the '597 patent to Cisco, but Dr. Cheriton is in privity with Arista, thereby applying assignor estoppel to Arista. Moreover, the arguments raised by Arista against the application of assignor estoppel in this investigation are addressed below and are shown to fail.

a. Dr. Cheriton's Assignment of the '597 Patent to Cisco

The evidence establishes that David Cheriton joined Cisco in [ ], when Cisco acquired his startup company (Granite Systems, Inc.) for approximately $220 million, and Dr. Cheriton remained at Cisco until [ ]. JX-0022C (Cheriton Dep. Tr.) at 21; CX-0798 at 062-64; CX-0529C ([ ]) at 056-61; CX-0012C (Lang WS) at Q/A 26-38, Q/A 102-106; CX-0530C ([ ]) at 047.

During his [ ], Dr. Cheriton served as [ ]. CX-0797C at 506; JX-0022C (Cheriton Dep. Tr.) at 34-35; CX-0012C (Lang WS) at Q/A 39-40. Cisco [ ] in connection with patents he invented and assigned to Cisco. JX-0022C (Cheriton Dep. Tr.) at 21, 23, 28-31; CX-0529C at 056; CX-0531C ([ ]) at 555-63; CX-0012C (Lang WS) at Q/A 63-101, Q/A 100-101; CX-0809 (copy of *In re Marriage of Cheriton*, 92 Cal. App. 4th 269, 280 (6 Dist. Ca. Sep. 14, 2001)); CX-0532C ([ ]) at 798-801. One such patent was U.S. Patent No. 7,340,597. JX-0004 (U.S. Patent No. 7,340,597) at 001; Duda Tr. 795-796.

The evidence establishes that Dr. Cheriton validly assigned the '597 patent to Cisco for consideration while he was employed there. CX-0012C (Lang WS) at Q/A 41, Q/A 50-57, Q/A 62-63. The assignment expressly states that Dr. Cheriton assigned "the entire right, title and interest" in his invention "and all patent applications and patent . . . for said invention" to Cisco, in exchange for "good and valuable consideration, receipt of which is hereby acknowledged." JX-0016 ('597 Assignment Reel) at 002; CX-0012C (Lang WS) at Q/A 55-57. The assignment bears Dr. Cheriton's signature, is notarized, and was recorded in the PTO four days after it was signed. JX-0016 ('597 Assignment Reel) at 002; CX-0012C (Lang WS) at Q/A 52, Q/A 57, Q/A 59; JX-0022C (Cheriton Dep. Tr.) at 51, 52. Dr. Cheriton also submitted an inventor's declaration as part of the '597 application. JX-0010 ('597 Certified File History) at 057-8; CX-0012C (Lang WS) at Q/A 42-49.

The '597 patent issued on March 4, 2008. JX-0004 ('597 patent). In 2014, Cisco Technology, Inc. transferred the '597 patent to Cisco Systems, Inc., the complainant in this investigation. JX-0016 ('597 Assignment Reel) at 004-10; CX-0012C (Lang WS) at Q/A 58, Q/A 60-61. Dr. Cheriton left Cisco on [ ]. CX-0530C ([ ]) at 047; CX-0012C (Lang WS) at Q/A 26, Q/A 102-106. [ ], he founded Arista with Andreas Bechtolsheim. Duda Tr. 796; JX-0022C (Cheriton Dep. Tr.) at 37, 38-39, 39-40; JX-0026C ([ ] Dep. Tr.) at 33; JX-0020C (Bechtolsheim Dep. Tr.) at 60; CX-0799 (Arista's Cross Complaint against OptumSoft) at 732.

b. Privity Between Dr. Cheriton and Arista

Evidence adduced at the hearing establishes that Arista is in privity with Dr. Cheriton for purposes of assignor estoppel. As an initial matter, Dr. Cheriton founded Arista. When defining a privy relationship, the Federal Circuit has identified a company "founded by the assignor" as an example of a company that is in privity with that assignor. *Diamond Scientific Co. v. Amico, Inc.*, 848 F.2d 1220, 1224 (Fed. Cir. 1988) ("The estoppel also operates to bar other parties in privity with the assignor, such as a corporation founded by the assignor."); *see also Juniper Networks, Inc. v. Palo Alto Networks, Inc.*, 15 F. Supp. 3d 499, 508 (D. Del. 2014) (founder status alone "dispositive of the issue of privity."); *Shamrock Tech. Inc. v. Medical Sterilization, Inc.*, 903 F.2d 789, 794 (Fed. Cir. 1990) (finding estoppel where the assignor was "far more than a mere employee"); *Mentor Graphics Corp. v. Quickturn Design Sys.*, 150 F.3d 1374, 1379 (Fed. Cir. 1998) (same, quoting *Shamrock*).

Second, after founding Arista, Dr. Cheriton remained a high-level employee with substantial power to influence Arista's operations. Specifically, Dr. Cheriton was a director on Arista's board and "Chief Scientist." JX-0022C (Cheriton Dep. Tr.) at 37, 46, 75; Duda Tr. 796; CX-0797C ([ ]) at 506; CX-0803 (Arista Update by Jayshree Ullal) at 480.

Third, Dr. Cheriton was positioned to profit, and did personally profit, from Arista's activities. Dr. Cheriton provided [ ] to found Arista and fund development of its products. JX-0022C (Cheriton Dep. Tr.) at 41-42, 46-47. Dr. Cheriton took a [ ] ownership stake at the outset, [ ]. Over the years, the value of Dr. Cheriton's shares in Arista has increased [ ]. JX-0022C (Cheriton Dep. Tr.) at 42; Duda Tr. 798; CX-0499 (Arista's Form S-1/A) at 224456-57; JX-0020C (Bechtolsheim Dep. Tr.) at 82.

Fourth, Dr. Cheriton oversaw and was involved with the development of the accused Arista products. [ ]. JX-0022C (Cheriton Dep. Tr.) at 157-158; JX-0020C (Bechtolsheim Dep. Tr.) at 60, 61. As Arista stated in a public court filing, "Cheriton was deeply involved in knowing and setting the direction of Arista's software development and had intimate knowledge of its software efforts over the years." CX-0799 (Arista's Cross Complaint against OptumSoft) at 732; Duda Tr. 797-798. Dr. Cheriton's activities included involvement in [ ]. JX-0022C (Cheriton Dep. Tr.) at 76-77, 79-82, 94-95; JX-0020C (Bechtolsheim Dep. Tr.) at 60. Indeed, for years after Arista was founded, [ ]. Duda Tr. 798-800, 805-807; JX-0022C (Cheriton Dep. Tr.) at 76-77, 79-80; JX-0026C (Duda Dep. Tr.) at 44, 48-50, 56.

Dr. Cheriton's influence on the accused products was substantial. He [ ]. JX-0022C (Cheriton Dep. Tr.) at 76-77, 79-82, 158; Duda Tr. 867, 799; JX-0020C (Bechtolsheim Dep. Tr.) at 60. Dr. Cheriton also invented a programming environment and runtime called [ ], which is used in both the development of Arista's software and on the switches themselves when Arista's software is running, and which Arista asserts is "[ ]." CX-0035C ([ ]) at ANI-ITC-944_945-0779973–74; Duda Tr. 798-800.

Fifth, Dr. Cheriton was [ ] in the design of the Arista feature that is covered by his patent. Duda Tr. 808-811, 876; JX-0022C (Cheriton Dep. Tr.) at 83-86, 88-93. Specifically, Dr. Cheriton [ ]. CX-0245C (AID 61) at ANI-ITC-944_945-0150232; Duda Tr. 812-816; JX-0022C (Cheriton Dep. Tr.) at 83-86; JX-0026C (Duda Dep. Tr.) at 97-99. Dr. Cheriton [ ]. *Id.*; *see also* Duda Tr. 809-811, 876. Other documents, such as internal e-mails to and from Dr. Cheriton, also show that [ ]. *Id.*; *see also* CX-0804C (Email from D. Cheriton) at 800-17; CX-0535C (Email from K. Duda) at 256-57; CX-0932C (Email from D. Cheriton) at 188; JX-0022C (Cheriton Dep. Tr.) at 88-89. In addition, Dr. Cheriton testified at his deposition that [ ], and that [ ]. JX-0022C (Cheriton Dep. Tr.) at 85-86, 89-93; Duda Tr. 816-817; CX-0804C (Email from D. Cheriton) at 800-17.

Accordingly, it is determined that Dr. Cheriton is "far more than a mere employee" or "mere shareholder" of Arista, and that Arista is in privity with Dr. Cheriton for purposes of the assignor estoppel analysis. *See Shamrock*, 903 F.2d at 794.

c. Assignor Estoppel Applies to Arista's Defenses Based on 35 U.S.C. § 101

Arista argues that Section 101-based defenses are exempt from the application of assignor estoppel, yet does not cite legal authority to support its position. *See* Resp. Br. at 223-24. Indeed, Arista states in its post-hearing brief: "Arista is aware of no court ever applying the doctrine of assignor estoppel to block a § 101 challenge, particularly not in this modern era of revitalized jurisprudence concerning non-patentable subject matter." *Id.* at 224.

The governing law states that the doctrine of assignor estoppel defeats "invalidity challenges based on . . . utility [and] patentable invention." *Diamond*, 848 F.2d at 1224; *Westinghouse Elec. & Mfg. Co. v. Formica Insulation Co.*, 266 U.S. 342, 349 (1924) ("[A]n assignor . . . is estopped to attack the utility . . . of a patented invention which he has assigned."); *see* 35 U.S.C. § 101 ("Inventions Patentable"); *Brenner v. Manson*, 383 U.S. 519, 528-29 (1966) ("utility" is a requirement of § 101). Moreover, the Federal Circuit rejected the idea that assignor estoppel is limited to defenses arising under a particular subchapter of Title 35. *Shamrock,* 903 F.2d at 794 ("We reject the contention that mere classification of a defense as equitable bars consideration of assignor estoppel.").

Accordingly, the application of assignor estoppel in this investigation is applicable to Arista's defense under § 101.

d. Arista May Not Argue That the Accused Feature Is Within the Prior Art and Thus Cannot Infringe

Arista also argues that, inasmuch as it alleges ProcMgr is within the prior art, Arista's products cannot infringe. *See* Resp. Br. at 224-25. In actuality, Arista has not established that ProcMgr is within the prior art. In any event, "there is no 'practicing the prior art' defense to literal infringement." *See Tate Access Floors, Inc. v. Interface Architectural Res., Inc.*, 279 F.3d

1357, 1365 (Fed. Cir. 2002) (citing *Baxter Healthcare Corp. v. Spectramed, Inc.*, 49 F.3d 1575, 1583 (Fed. Cir. 1995)). Furthermore, Arista's reliance on *Mentor Graphics* (which cites to *Scott Paper Co. v. Marcalus Mfg. Co.,* 326 U.S. 249, (1945)) as justification that this argument is permissible under the assignor estoppel doctrine is misplaced. *See* Resp. Br. at 224-25. In particular, *Tate* distinguishes the situation in *Scott Paper*, explaining that there the assignor was allowed to "measure the extent of anticipation for the purpose of limiting the claims of the assigned patents, and thus avoid infringement." *Tate*, 279 F.3d at 1369 (citing *Scott Paper*, 326 U.S. at 250). In the circumstances of this investigation, Arista presents its invalidity argument as a non-infringement theory, a practice that the Federal Circuit has held to be ineffectual. *See Tate* 279 F.3d at 1365.

e. The Doctrine of Assignor Estoppel Applies to This Investigation

Inasmuch as "[t]he principle of fair dealing . . . whereby the assignor will not be allowed to say that what he has sold as a patent was not a patent has been part of the fabric of our law throughout the life of this nation," it is determined that assignor estoppel acts as a bar to Arista's invalidity defenses with respect to the '597 patent in this investigation. *See Diamond*, 848 F.2d at 1224. Moreover, the Federal Circuit has held that "both statutory and case law required that assignor estoppel be considered and applied in section 337 cases," and instructed that "the Commission's public interest responsibilities do not give it an independent duty to determine the validity of a patent where no party made such a challenge." *Intel*, 946 F.2d at 837 (citing *Lannom Mfg. Co. v. Int'l Trade Comm'n*, 799 F.2d 1572, 1579 (Fed. Cir. 1986)).

Although it has been determined that assignor estoppel bars Arista's invalidity arguments with respect to the '597 patent, those arguments are addressed in the sections below for completeness.

2. Patent Eligibility Under 35 U.S.C. § 101

Arista argues that that the asserted claims of the '597 patent are invalid for claiming patent-ineligible subject matter. *See* Resp. Br. at 182-90. Arista's arguments fail, however, inasmuch as the '597 patent is directed to a specific thing, *i.e.*, a communications device with a specific arrangement of components within the device, including a logging module and a device subsystem that the logging module is coupled to and monitors, and not an abstract idea. The first sentence of the patent abstract recites "[a] logging module is disclosed," and goes on to teach that a hardware device can "be made secure through the use of[] the logging module." JX-0004 ('597 patent) at Abstract. This on-device logging module, as the specification makes clear, secures that device by "detect[ing] a change in the configuration of [a] subsystem" and communicating "that the change has occurred." *Id.* at col. 6, lns. 7-10; *see id.* at Abstract; col. 4, lns. 16-19; col. 7, lns. 20-30; col. 8, lns. 50-52. Indeed, the logging module as described in the specification is described in concrete terms as a well-defined part of the device that performs a specific role within the device's architecture and is distinct from, but coupled to, the subsystem it monitors. *Id.* at col. 6, lns. 5-7; col. 7, lns. 16-20; Figs. 1, 2.

Similarly, claim 39 recites "a logging module" that "is coupled to" a "subsystem of a communications device" to detect and communicate "a change in a configuration" of the subsystem. JX-0004 ('597 patent) at col. 19, lns. 21-28; *see id.* at col. 16, lns. 44-52 (claim 1); col. 21, lns. 23-30 (claim 71). Such a recitation is the opposite of "an idea, having no particular concrete or tangible form" that would be deemed unpatentable subject matter under Section 101.

See Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 715 (Fed. Cir. 2014). The patent claims describe not only the desired functionality, but also a specific and non-generic arrangement of components within a particular type of device to carry out that functionality within the device, thereby improving the device. Such a specific, concrete improvement to "the functioning of" a network device does not "disproportionately t[ie] up the use of" the "'building block[s]' of human ingenuity." *See Alice Corp. Pty. Ltd. v. CLS Bank Int'l.*, 134 S. Ct. 2347, 2354-55, 2359 (2014) (quoting *Mayo*, 132 S. Ct. at 1294, 1303).

3. Invalidity Over the Prior Art

a. Anticipation – U.S. Patent Pub. 2002/0078382 to Sheikh

The record evidence shows that Sheikh does not anticipate any of the independent claims, and therefore does not anticipate any of the associated dependent claims, of the '597 patent, under any party's constructions. CX-1216C (Wicker RWS) at Q/A 80-87; Q/A 136-146, Q/A 151, Q/A 154. The system described Sheikh is distributed over multiple devices connected over a network, *i.e.*, a central server and one or more remote servers. *Id.*; *see* RX-3293 (Sheikh) at Abstract, 0032. As an initial matter, a server is not a communications device, and Sheikh only discloses remotely monitoring communications devices such as routers. CX-1216C (Wicker RWS) at Q/A 141-44; RX-3293 (Sheikh) at 0033-34. Second, the central server contains a "master transport" 110a that "provides for the polling of one or more agent transports, which are located throughout network 100a on the agent transport's associated host servers." CX-1216C (Wicker RWS) at Q/A 138-39; *see* RX-3293 (Sheikh) at 0032. In Sheikh, the master transport controls each remote agent by "pushing," or "sending," a software package to the agent that contains the necessary monitoring sensors. CX-1216C (Wicker RWS) at Q/A 138-39; RX-3293 (Sheikh) at 0044. Without a software package containing the necessary sensor configuration, the agent is unable to perform any detecting. CX-1216C (Wicker RWS) at Q/A 138-39; RX-3293 (Sheikh) at 0043. This does not disclose the claimed architecture of the '597 patent, *i.e.*, a communications device comprising a logging module and a subsystem. CX-1216C (Wicker RWS) at Q/A 136-44. Instead, Sheikh discloses the same network-focused security vulnerability the invention of the '597 patent addressed. RX-3293 (Sheikh) at 0010.

Sheikh also does not anticipate claim 14 because it does not satisfy the limitation requiring "the subsystem is a communications interface"—the network between the server and the router, and the disclosed monitoring is interrogation of the device as a whole. CX-1216C (Wicker RWS) at Q/A 147.

Sheikh also does not anticipate claim 15 because it does not disclose the restricted access limitation. CX-1216C (Wicker RWS) at Q/A 148-149. First, Sheikh does not disclose the logging module containing restricted access. *Id.* Second, Sheikh describes at 0044 a system that provides sensor configuration information over the network. *See* RX-3293 (Sheikh) at 0044. Regardless of whether communications are encrypted or not, network-based security solutions allowed attackers to undermine the effectiveness of the solutions, and are examples of the problems with the prior art that the '597 patent sought to solve. CX-1216C (Wicker RWS) at Q/A 148-149.

Finally, Sheikh does not anticipate dependent claims 29, 63, 64, or 73 because it does not disclose the limitation of "broadcasting." CX-1216C (Wicker RWS) at Q/A 150. First, "communicating configuration changes to one or more master transports" is not broadcasting the change by a logging module. *Id.* As the specification teaches, "[t]he task of the master transport is to poll each agent transport in turn, receive the results, decrypt that information, evaluate it, store it on its central server and report the information upon request by a user." *Id.*; RX-3293

(Sheikh) at 0040. In this situation, the agent transport is directly sending data to the master transport in response to the poll. Second, "transmitting the changes as alerts through a variety of systems" does not disclose broadcasting the change by a logging module. CX-1216C (Wicker RWS) at Q/A 150. The "alerts" in Sheikh are not broadcast; they are sent directly to and received by the device specified by the administrator. *Id.*; RX-3293 (Sheikh) at 0093. Further, Sheikh explains that the "alerts" on which Arista relies for its argument are sent by the master transport. CX-1216C (Wicker RWS) at Q/A 150.

b. Anticipation and Obviousness – U.S. Patent No. 7,316,016 to DiFalco

Arista has not shown that DiFalco anticipates or renders obvious any of the independent claims, and therefore any of the associated dependent claims, of the '597 patent under any party's constructions. CX-1216C (Wicker RWS) at Q/A 88, Q/A 160-66, Q/A 170, Q/A 173. DiFalco is a "distributed" and "scalable architecture" that can be managed from a console to periodically detect state changes of heterogeneous nodes across a network. *Id.*; RX-3292 (DiFalco) at col. 1, lns. 7-16. The distributed system of DiFalco includes clients (102), which represent devices that can include a "station service" (103) where "Rules" are processed and contain the criteria for monitoring state-changes and can "be applied to multiple locations or notes on a network." *Id.* If a client contains a station service, it is an active node and the rules can be processed locally. If the client does not contain a station service, it is then considered a passive node. *Id.*; RX-3292 (DiFalco) at col. 2, lns. 45-67; col. 3, lns. 1-20. Communications devices are limited to being passive nodes, *i.e.*, nodes acted on remotely. *Id.* This is not the claimed architecture of the '597 patent, *i.e.*, a communications device comprising a logging module and a subsystem. *Id.*

DiFalco also not anticipate claim 14 because it does not satisfy the limitation requiring "the subsystem is a communications interface." In particular, the station service monitoring would need to take place remotely, but DiFalco does not disclose or enable the ability to do this. CX-1216C (Wicker RWS) at Q/A 167.

Moreover, DiFalco also does not anticipate claim 15 because it does not disclose the restricted access limitation. CX-1216C (Wicker RWS) at Q/A 168. Arista's expert Dr. Hollingsworth has testified that the "security service" or "remedying response" taught in DiFalco provides this functionality, but the evidence shows otherwise. *See id.* With respect to the remedying response feature, DiFalco explains that a remedying response "may update the baseline that is used to detect state-changes or a [sic] restore an object to its baseline state," and restoring after a change is not restricting as required by the claim language. *See id.*; RX-3292 (DiFalco) at col. 6, lns. 45-47. Indeed, DiFalco teaches that "a remedying response may update the baseline that is used to detect state-changes or restore an object to its baseline state." *See id.*; RX-3292 (DiFalco) at col. 3, lns. 31-41.

DiFalco also does not anticipate claims 29, 63, 64, or 73 because it does not teach the limitation requiring "broadcast[ing]." CX-1216C (Wicker RWS) at Q/A 169. Specifically, nothing in DiFalco discloses configuring an SNMP trap to broadcast data. *Id.*

With respect to Arista's obviousness arguments, the evidence fails to establish that a person of ordinary skill in the art would know to configure an SNMP trap in the system of DiFalco to be sent to a broadcast address. CX-1216C (Wicker RWS) at Q/A 169. Moreover, the evidence also fails to establish that a person of ordinary skill in the art would be motivated to combine DiFalco with Sheikh to arrive at the inventions claimed in the '597 patent. *Id.* at Q/A 121-125. As Dr. Wicker testified, "DiFalco and Sheikh address different problems and the disclosures in each are incompatible with one another." *Id.* at Q/A 123. In particular, Dr. Wicker testified:

> DiFalco explicitly excludes communication devices from the category of "active nodes" that detect state changes at 3:14-19. Thus, even if Sheikh disclosed monitoring a mail subsystem and using that mail subsystem to broadcast change information, the system of Sheikh would not work in DiFalco. . . . DiFalco never suggests modifying its system by using a monitored mail subsystem to broadcast state changes or otherwise. In fact, DiFalco explicitly discourages such modifications. Thus, the combination proposed by Dr. Hollingsworth is impermissible hindsight.

Id. Q/A 124-125.

Therefore, it is determined that the DiFalco reference does not anticipate or render obvious the asserted claims of the '597 patent.

c. Anticipation – WebLogic Guide

The evidence adduced at the hearing demonstrates that the WebLogic Guide does not anticipate any of the asserted '597 patent claims under all claim constructions proposed by the parties. CX-1216C (Wicker RWS) at Q/A 106-109, Q/A 230-233, Q/A 237, Q/A 240. The WebLogic Guide describes application servers known as WebLogic servers used for developing and deploying distributed enterprise applications. *Id.* As the WebLogic Guide explains at pages 1-2, the "basic administrative unit for WebLogic Servers is called a domain." *Id.* "A domain is a logically related group of WebLogic Server resources that are managed as a unit by a WebLogic Server instance configured as the Administration Server." The WebLogic Guide provides an example domain configuration in Figure 1-1. *Id.* As illustrated at 1-4, the domain consists of Machine A, an "Administration Server" that hosts one instance of WebLogic Server, and Machines B and C, "Managed Servers" that each host two instances of WebLogic Server. *Id.* This is not the claimed architecture of the '597 patent (a communications device comprising a logging module and a subsystem). *See id.* Further, relying on individual subsystems to monitor their own health status do not disclose the claimed "subsystem; and a logging module, coupled to said subsystem, and configured to detect a change to a configuration of said subsystem of said communications device." *See id.* Unlike the invention of the '597 patent, an attacker can comprise the subsystem of a server instance in the WebLogic Guide and use it to modify the self-health mechanism. *See id.*

In addition, WebLogic does not anticipate claim 14 because it does not satisfy the limitation of "the subsystem is a communications interface," inasmuch as a software messaging service is not the same as a communication interface of a communications device. CX-1216C (Wicker RWS) at Q/A 234.

WebLogic also does not anticipate claim 15 because it does not disclose the recited restricted access limitation. CX-1216C (Wicker RWS) at Q/A 235. Instead, WebLogic describes a security scheme that allows for configuration of groups, roles, policies, and permissions. *Id.*; RX-3296 (WebLogic Guide) at 8-8.

Moreover, WebLogic does not anticipate claims 29, 63, 64, or 73 because it does not satisfy the limitation that requires "broadcast[ing]." *See* CX-1216C (Wicker RWS) at Q/A 236.

d. Anticipation and Obviousness – IOS 11.2.1

The record evidence shows that IOS 11.2.1 does not anticipate or render obvious any of asserted claims of the '597 patent under all claim constructions proposed by the parties.[30] *See* CX-1279C (Wicker SRWS).

Arista identifies three functionalities in IOS 11.2.1, *i.e.*, the watchdog mechanism, the chassis daemon, and Syslog, as satisfying the logging module claim limitation, but the evidence

[30] Arista does not allege claims 15 or 64 are anticipated or rendered obvious by IOS 11.2.1.

shows otherwise. *See* CX-1279C (Wicker SRWS) at Q/A 19-32. Specifically, Syslog does not generate log messages or detect changes to any subsystem. CX-1279C (Wicker SRWS) at Q/A 26, Q/A 31; JX-0050C (Edsall Dep. Tr.) at 155, 156, 180. The "watchdog mechanism" also does not satisfy a logging module limitation, inasmuch as the "watchdog mechanism" operates as part of the process itself to determine whether a process has been executing too long, *i.e.*, the subsystem is required to perform its own detecting and logging. CX-1279C (Wicker SRWS) at Q/A 21. The "chassis daemon" mechanism also does not satisfy the a logging module limitation because it is the support code for the chassis interface that itself polls statistics related to the chassis interface. CX-1279C (Wicker SRWS) at Q/A 28-30. As with the "watchdog" mechanism, this is code for the chassis interface and does not constitute a logging module coupled to a subsystem. *Id.*

The record also fails to show that the IOS 11.2.1 satisfies the "broadcasting" claim limitation "broadcasting" recited in claims 29, 63, 64, or 73. CX-1279C (Wicker SWS) at Q/A 34.

With respect to Arista's obviousness arguments, the evidence fails to establish that a person of ordinary skill in the art would know to configure an SNMP trap to be sent to a broadcast address. *See* CX-1216C (Wicker RWS) at Q/A 34.

Therefore, it is determined that the IOS 11.2.1 does not anticipate or render obvious the asserted claims of the '597 patent.

e. Secondary Considerations of Nonobviousness

The nonobviousness of the '597 patent is also demonstrated by evidence suggesting that [ ]. *See* CX-1216C (Wicker RWS) at Q/A 246-251. The evidence shows that Arista was aware of the invention of the '597 patent in particular because the named inventor, David Cheriton, co-founded Arista. Arista has also praised the invention of the '597 patent and its unexpected results. CX-0335 ("Arista White Paper - EOS" 2015 version); CX-0273; CX-0268 ("Arista Whitepaper - EOS"); CX-0259 ("Arista Cloud Networking Portfolio").

VII. The '592 and '145 (Private VLAN) Patents

A. Claim Construction

1. Level of Ordinary Skill

Although the private parties and the Staff each proposed a different definition of a person having ordinary skill in the art with respect to the Private VLAN Patents, all agree that the differences between the competing proposals do not affect the analysis in this investigation. *See* Compl. Br. at 214; Resp. Br. at 300-01; Staff Br. at 83.

For example, Arista proposes that a person of ordinary skill in the field of art of the '592 and '145 patents would be a person with a Bachelor of Science or Bachelor of Art degree in computer science, computer engineering, electrical engineering, or a closely related field, along with 2-4 years of industry experience in computer networks and systems. RX-3136C (Moisand WS) at Q/A 18-21. Additional education in a relevant field, such as computer science, computer engineering, or electrical engineering, or industry experience may compensate for a deficit in one of the other aspects of the above. *Id.*

The Staff proposes that a person of ordinary skill in the art would be a person with a Bachelor of Science degree in computer science, computer engineering, electrical engineering, or a closely related field, along with 2 years of experience in the field of computer networks, systems, and network devices. Staff Br. at 83. Cisco "is willing to accept Staff's proposed definition for the Private VLAN patents." Compl. Br. at 214.

Inasmuch as the parties are in substantial agreement regarding the level of ordinary skill, it is determined that a person of ordinary skill in the art with respect to the '592 and '145 patents would be a person with a Bachelor of Science degree in computer science, computer engineering, electrical engineering, or a closely related field, along with two years of experience in the field of computer networks, systems, or network devices.

2. Disputed Claim Terms

a. "promiscuous port" ('592 patent claims 6, 7, 20, and 21; '145 patent claims 7 and 46)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
port for exchanging packets with one or more isolated ports and community ports by use of VLANs	a physical port on a layer 2 switch or bridge that is connected to a layer 3 or layer 4 device of the OSI reference model external to the switch and that is connected to VLANs internal to the switch, including a primary VLAN and isolated VLAN and/or community VLAN. A promiscuous port transmits packets onto a primary VLAN and receives packets from an isolated VLAN and/or community VLAN.	a port that is connected to layer 3 or 4 devices and that exchanges packets with isolated ports and community ports by use of VLANs internal to the switch

The claim term "promiscuous port" appears in claims 6, 7, 20, and 21 of the '592 patent, as well as in claims 7 and 46 of the '145 patent. As proposed by Cisco, the term is construed to mean "port for exchanging packets with one or more isolated ports and community ports by use of VLANs." This construction is consistent with the claim language and is supported by the specification.

In particular, the express language of the claims require that the promiscuous ports exchange packets with isolated or community ports using VLANs. Thus, for example, asserted claim 6 of the '592 patent requires an "isolated port exchanging packets with said promiscuous port," while asserted claim 7 requires a "community of ports exchanging packets . . . with said promiscuous ports." JX-0005 ('592 patent). The specification also supports the adopted claim construction, disclosing that "[i]solated ports and community ports exchange packets with the promiscuous ports by use of the VLANs internal to the switch." JX-0005 ('592 patent) at col. 2, lns. 20-26; CX-0003C (Jeffay WS) at Q/A 62. This description is repeated several times throughout the specification. *See*, *e.g.*, JX-0005 ('592 patent) at col. 4, lns. 46-49 ("[A]ny packet received by a promiscuous port . . . may be received by any isolated port or community port."); col. 4, lns. 53-55 ("Isolated VLAN 240 carries packet traffic from isolated ports to the promiscuous ports."); col. 5., lns. 25-30 (packets are "transferred by community VLAN #2 350 . . . to all of the promiscuous ports"); Fig. 2; Fig. 3.

The claim construction proposed by Arista, however, adds limitations that conflict with the claim language and intrinsic evidence. For instance, Arista's construction requires that each "promiscuous port" be "connected to VLANs . . . including a primary VLAN and isolated VLAN and/or community VLAN." *See* RX-3136C (Moisand WS) at Q/A 103. The addition of this limitation conflicts with the express claim language. According to the claims, a promiscuous port need not be connected to all three types of VLANs: some claims specify that promiscuous ports receive packets over isolated VLANs only (*e.g.*, '592 patent claims 8, 12, 17, 20, and 23; '145 patent claims 11, 22, 33, 39, 40, and 41), other claims specify that promiscuous ports receive packets over require community VLANs only (*e.g.*, '592 patent, claims 18, 21, and 24; '145 patent claims 12, 23, 34, 42, 43, 44, and 46), and still other claims do not require isolated or community VLANs at all (*e.g.*, '145 patent claims 1, 3, 5, 13, 15, 24, 26, 35, and 45).

Arista proposes a further requirement that the VLANs used by the promiscuous port be "internal to the switch."[31] This additional limitation conflicts with the claim language. For example, asserted claims 6 and 7 of the '592 patent require "exchanging packets . . . through a path inside said switch," while asserted claims 20 and 21 do not have this requirement. Adding a requirement that a VLAN must be "internal to the switch" to the construction of "promiscuous port" would make the express language in claims 6 and 7 redundant while at the same time adding unclaimed limitations to claims 20 and 21. Adding an "internal to the switch" limitation would also exclude the "trunk port" embodiments used to extend the private VLANs from within an individual switch to cross over between two switches. CX-0003C (Jeffay WS) at Q/A 65; JX-0005 ('592 patent) at col. 3, lns. 4-6; Fig. 8.

Arista's proposed construction also defines "promiscuous port" as a port on a layer 2 switch, but this limitation conflicts with the claim language and is inconsistent with the specification. As an initial matter, some claims of the '592 patent are directed to a "switch," whereas some claims of the '145 patent are directed to a "router." Moreover, according to the specification, the claimed invention can be implemented on a router: "As an example, primary VLANs and secondary VLANs (that is Isolated or Community VLANS) are programmed in the router using Color Blocking Logic (CBL)." JX-0005 ('592 patent) at col. 7, lns. 25-27; *see id.* at col. 6, lns. 53-57; col. 7, lns. 13-16; CX-1220C (Jeffay RWS) at Q/A 40. Arista's proposed construction also renders redundant certain dependent claims, such as claim 10 of the '592 patent, that are specifically directed to "layer 2 switches."

Arista proposes a construction requiring that a promiscuous port be a "physical port," arguing that the patent "illustrates the ports as the connections on the switch itself." *See*

[31] This requirement is also proposed by the Staff in its construction.

RX-3136C (Moisand WS) at Q/A 103. Arista relies on the deposition testimony of named inventor Thomas Edsall to support this facet of its proposed construction, but Mr. Edsall's testimony describes one way in which a port could be isolated, and not the meaning of the term "port" in the context of the claim language. *See* RX-3136C (Moisand WS) at Q/A 103; CX-1220C (Jeffay RWS) at Q/A 42.

Arista's proposed construction also requires that a "promiscuous port" be connected to layer 3 or layer 4 devices.[32] *See* RX-3136C (Moisand WS) at Q/A 103. Nevertheless, no such requirement exists in the claims which are directed to a single device such as a "switch" ('592 patent) or a "router" ('145 patent), instead of to additional devices connected to the switch or router. CX-1220C (Jeffay RWS) at Q/A 41. Requiring that a promiscuous port include a connection to a separate device when the claim itself is directed to a single, standalone device is illogical. *See id.*

Therefore, the term "promiscuous port" is construed to mean "port for exchanging packets with one or more isolated ports and community ports by use of VLANs."

b. "isolated port" ('592 patent claims 6 and 20; '145 patent claim 7)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
port for exchanging packets with one or more promiscuous ports by use of VLANs but that cannot transfer packets to another isolated port	a physical port on a layer 2 switch or bridge that is connected to user devices and is configured to exchange packets with the promiscuous ports by use of the VLANs internal to the switch, including a primary VLAN and isolated VLAN, where an isolated port cannot transfer packets to another isolated port	port that exchanges packets with the promiscuous ports by use of the VLANs internal to the switch but that cannot transfer packets to another isolated port

[32] This requirement is also proposed by the Staff in its construction.

The claim term "isolated port" appears in asserted claims 6 and 20 of the '592 patent, as well as asserted claim 7 of the '145 patent. As proposed by Cisco, this term is construed to mean "port for exchanging packets with one or more promiscuous ports by use of VLANs but that cannot transfer packets to another isolated port," a construction that is consistent with the claim language and the specification.[33]

The language of the claims expressly requires that isolated ports exchange packets with promiscuous ports, but not other isolated ports. *See, e.g.*, JX-0005 ('592 patent) at claim 6 (requiring "said selected isolated port exchanging packets with said promiscuous port" and "not exchanging packets with another isolated port"). The specification also supports the adopted construction, stating that "[i]solated ports . . . exchange packets with the promiscuous ports by use of the VLANs internal to the switch . . . [but] an isolated port cannot transfer packets to another isolated port." JX-005 ('592 patent) at col. 2, lns. 20-22; *see* CX-0003C (Jeffay WS) at Q/A 62, Q/A 67; JX-0005 at col. 2, lns. 38-41 (an isolated VLAN "transfers the packets [from isolated ports] to the promiscuous ports . . . [but] does not deliver any packets to another isolated port"); col. 4, lns. 53-55 ("Isolated VLAN 240 carries packet traffic from isolated ports to the promiscuous ports . . . [and] is configured so that it cannot deliver any packets to an isolated port."); Fig. 2.

Arista's proposed construction add limitations to the functionality taught by the specification, requiring that the isolated port communicate with the primary and isolated VLANs

[33] The construction proposed by the Staff is similar to the adopted construction, although the Staff's construction adds the phrase "internal to the switch." As discussed above with respect to the claim term "promiscuous port," adoption of this additional phrase is not warranted by the intrinsic evidence.

referenced in the specification, the VLANs be "internal to the switch," the isolated port reside on a "layer 2" switch, the isolated port be a "physical" port, and the isolated port be connected to user devices. RX-3136C (Moisand WS) at Q/A 109-110. The additional limitations are not supported by the intrinsic evidence and are not adopted for reasons similar to those set forth in the discussion with respect to the clam term "promiscuous port." *See* CX-1220C (Jeffay RWS) at Q/A 39-43.

Therefore, the term "isolated port" is construed to mean "port for exchanging packets with one or more promiscuous ports by use of VLANs but that cannot transfer packets to another isolated port."

c. "community port" ('592 patent claims 7 and 21; '145 patent claims 7 and 46)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
"port for exchanging packets with one or more promiscuous ports by use of VLANs and that can transfer packets to a designated number of other community ports	a physical port on a layer 2 switch or bridge that is connected to user devices and is configured to exchange packets with the promiscuous ports by use of the VLANs internal to the switch, including a primary VLAN and community VLAN, where a community port has a designated number of community ports to which it can transfer packets	a port that exchanges packets with the promiscuous ports by use of the VLANs internal to the switch and that can transfer packets to a designated number of other community ports

The claim term "community port" appears in asserted claims 7 and 21 of the '592 patent, as well as in asserted claims 7 and 46 of the '145 patent. As proposed by Cisco, this claim term is construed to mean "port for exchanging packets with one or more promiscuous ports by use of

VLANs and that can transfer packets to a designated number of other community ports," a construction that is supported by the claim language and the specification.[34]

The language of the claims requires that community ports exchange packets with promiscuous ports and other designated community ports. *See, e.g.*, JX-0005 ('592 patent) at claim 7 (reciting "each of said community ports . . . exchanging packets through a path internal to said switch with said promiscuous port . . . [and] with all ports of said plurality of community ports"). The specification also supports the adopted construction, stating that "community ports exchange packets with the promiscuous ports by use of the VLANs internal to the switch . . . [and a community port] has a designated number of community ports to which it can transfer packets." JX-0005 ('592) at col. 2, lns. 20-26; *see* CX-0003C (Jeffay WS) at Q/A 72; JX-0005 at col. 2, lns. 49-52 ("The community VLAN transfers a packet . . . [from] a community port to all of the promiscuous ports, and . . . to the other community ports attached to that community VLAN."); col. 5, lns. 12-18 ("A packet transferred to the community VLAN from a community port is received by all of the community ports connected to the community VLAN, and also all of the promiscuous ports."); Fig. 3.

Arista's proposed construction add limitations to the functionality taught by the specification, requiring that the community port communicate with the primary and community VLANs referenced in the specification, the VLANs be "internal to the switch," the community port reside on a "layer 2" switch, the community port be a "physical" port, and the community port be connected to user devices. *See* RX-3136C (Moisand WS) at Q/A 115-116. The

[34] The construction proposed by the Staff is similar to the adopted construction, although the Staff's construction adds the phrase "internal to the switch." As discussed above with respect to the claim term "promiscuous port," adoption of this additional phrase is not warranted by the intrinsic evidence.

additional limitations are not supported by the intrinsic evidence and are not adopted for reasons similar to those set forth in the discussion with respect to the clam term "promiscuous port." *See* CX-1220C (Jeffay RWS) at Q/A 39-42, Q/A 44.

Therefore, the term "community port" is construed to mean "port for exchanging packets with one or more promiscuous ports by use of VLANs and that can transfer packets to a designated number of other community ports."

d. "primary VLAN" ('592 patent claims 20 and 21; '145 patent claims 7 and 46)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
a VLAN that connects to all or a subset of promiscuous ports, to all or a subset of isolated ports, and to all or a subset of community ports. The primary VLAN receives packets from outside of the switch arriving at any of the promiscuous ports, and transfers the packets to the isolated or community ports. However, an isolated or community port cannot receive traffic from the external LAN connected to it, and transfer the packets to the primary VLAN. The primary VLAN is a one way connection from promiscuous ports to isolated or community ports.	a VLAN connecting to all promiscuous ports, to all isolated ports, and to all community ports. The primary VLAN receives packets from outside of the switch arriving at any of the promiscuous ports, and transfers the packets to the isolated or community ports. However, an isolated or community port cannot receive traffic from the external LAN connected to it, and transfer the packets to the primary VLAN. The primary VLAN is a one way connection from promiscuous ports to isolated or community ports.	a VLAN that connects to all promiscuous ports, to all isolated ports, and to all community ports. The primary VLAN receives packets from outside of the switch arriving at any of the promiscuous ports, and transfers the packets to the isolated or community ports. However, an isolated or community port cannot receive traffic from the external LAN connected to it, and transfer the packets to the primary VLAN. The primary VLAN is a one way connection from promiscuous ports to isolated or community ports.

The claim term "primary VLAN" is recited in asserted claims 20 and 21 of the '592 patent, as well as in asserted claims 7 and 46 of the '145 patent. As proposed by Cisco, this claim term is construed to mean "a VLAN that connects to all or a subset of promiscuous ports, to all or a subset of isolated ports, and to all or a subset of community ports." Moreover, "[t]he primary VLAN receives packets from outside of the switch arriving at any of the promiscuous ports, and transfers the packets to the isolated or community ports. However, an isolated or community port cannot receive traffic from the external LAN connected to it, and transfer the packets to the primary VLAN. The primary VLAN is a one way connection from promiscuous ports to isolated or community ports." This construction is supported by the claim language and the specification.

Specifically, the claims themselves specify that a primary VLAN is not required to connect to all promiscuous, isolated, and community ports. Independent claim 20 of the '592 patent recites a switch in which "***all*** promiscuous ports [are] also connected via a one way primary VLAN to said ***all*** isolated ports." JX-0005 ('592 patent) at claim 20 (emphasis added). By contrast, independent claim 7 of the '145 patent requires only that the primary VLAN connect to "one or more promiscuous ports." JX-0006 ('145 patent) at claim 7. Inasmuch as the claim term "primary VLAN" is construed the same for both patents, this demonstrates that a VLAN is required to connect to at least a subset of ports, and not necessarily all ports.

The specification also confirms that a primary VLAN may connect to all or only a subset of the ports:

> [I]n an alternative exemplary embodiments of the invention, a single primary VLAN may connect to only a subset of promiscuous ports. In such an alternative embodiment, there may be a plurality of primary VLANs, each with its associated promiscuous ports and associated isolated or community ports.

JX-0005 ('592) at col. 9, lns. 61-66.

The specification also provides:

> Alternatively, a single L2 switch, or a network or trunked L2 switches, may have its promiscuous ports divided into subsets. Each subset of the promiscuous ports is then associated with its subset of isolated ports and community ports, along with the necessary VLAN.

JX-0005 ('592) at col. 3, lns. 7-11.

The specification teaches that such an exemplary embodiment may be desirable because it "gives a system designer flexibility in arranging connections to L3/L4 devices through promiscuous ports, and to user equipment connected at isolated ports or community ports." JX-0005 ('592 patent) at col. 9, ln. 65 – col. 10, ln. 3. Thus, as Cisco's expert Dr. Jeffay explained, a person skilled in the art would understand that the claimed VLANs need not connect to all ports. CX-0003C (Jeffay WS) at Q/A 79; CX-1220C (Jeffay RWS) at Q/A 46.

By contrast, the construction proposed by the Arista and the Staff requires that the primary VLAN connect to "all promiscuous ports, to all isolated ports, and to all community ports." This construction is in conflict with the language of the claims. For example, claim 6 of the '592 patent requires only that the switch have promiscuous and isolated ports, and does not require that the switch have community ports. JX-0005 ('592 patent) at claim 6; *see* CX-1220C (Jeffay RWS) at Q/A 46. In addition, as discussed above, defining a primary VLAN as being connected to "all" ports would render redundant those claims which expressly recite that as a limitation. *See, e.g.*, JX-0005 ('592 patent) at claim 20.

Moreover, even though the summary of invention section of the patent states that "[t]he primary VLAN connects to all promiscuous ports, to all isolated ports and to all community ports," this statement, when read in context with the rest of the specification and the claims, does not mean that a primary VLAN must connect to all ports on a switch. *See* JX-0005 ('592 patent) at col. 2, lns. 27-36; CX-0003C (Jeffay WS) at Q/A 79. Rather, a person having ordinary skill in the art would understand that statement to mean that the primary VLAN need only connect to all the ports in that primary VLAN. Any other interpretation would be inconsistent with the embodiments that explicitly allow a primary VLAN to connect to only a subset of promiscuous ports. CX-0003C (Jeffay WS) at Q/A 79; *see* JX-0005 ('592 patent) at col. 9, lns. 61-66.

Accordingly, the claim term "primary VLAN" is construed to mean "a VLAN that connects to all or a subset of promiscuous ports, to all or a subset of isolated ports, and to all or a subset of community ports," with the additional requirement that "[t]he primary VLAN receives packets from outside of the switch arriving at any of the promiscuous ports, and transfers the packets to the isolated or community ports. However, an isolated or community port cannot receive traffic from the external LAN connected to it, and transfer the packets to the primary VLAN. The primary VLAN is a one way connection from promiscuous ports to isolated or community ports."

e. "isolated VLAN" ('592 patent claim 20; '145 patent claim 7)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
a VLAN connecting to all or a subset of promiscuous ports and connecting to all or a subset of isolated ports. An isolated VLAN receives packets arriving from outside of the switch at an isolated port, and transfers the packets to the promiscuous ports. An isolated VLAN does not carry packets received by a promiscuous port from outside of the switch. Also, an isolated VLAN does not deliver any packets to another isolated port. The isolated VLAN is a one way connection from an isolated port to the promiscuous ports.	a VLAN connecting to all promiscuous ports and connecting to all isolated ports. An isolated VLAN receives packets arriving from outside of the switch at an isolated port, and transfers the packets to the promiscuous ports. An isolated VLAN does not carry packets received by a promiscuous port from outside of the switch. Also, an isolated VLAN does not deliver any packets to another isolated port. The isolated VLAN is a one way connection from an isolated port to the promiscuous ports.	a VLAN connecting to all promiscuous ports and connecting to all isolated ports. An isolated VLAN receives packets arriving from outside of the switch at an isolated port, and transfers the packets to the promiscuous ports. An isolated VLAN does not carry packets received by a promiscuous port from outside of the switch. Also, an isolated VLAN does not deliver any packets to another isolated port. The isolated VLAN is a one way connection from an isolated port to the promiscuous ports.

The claim term "isolated VLAN" appears in asserted claim 20 of the '592 patent, as well as asserted claim 7 of the '145 patent. As proposed by Cisco, this term is construed to mean "a VLAN connecting to all or a subset of promiscuous ports and connecting to all or a subset of isolated ports." Moreover, "[a]n isolated VLAN receives packets arriving from outside of the switch at an isolated port, and transfers the packets to the promiscuous ports. An isolated VLAN does not carry packets received by a promiscuous port from outside of the switch. Also, an isolated VLAN does not deliver any packets to another isolated port. The isolated VLAN is a one way connection from an isolated port to the promiscuous ports." This construction is supported by the claim language and the specification.

As with the claim term "primary VLAN" discussed above, the dispute among the parties with respect to the claim term "isolated VLAN" is whether the isolated VLAN connects to "all or a subset" of promiscuous and isolated ports, or to "all" promiscuous and isolated ports. For the reasons set forth above with respect to "primary VLAN," the construction adopted for "isolated VLAN" is correct and reflects the various embodiments described in the specification.

f. "community VLAN" ('592 patent claim 21; '145 patent claims 7 and 46)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
VLAN connecting to a group of community ports, and also connecting to all or a subset of the promiscuous ports. The group of community ports is referred to as a 'community' of community ports. The community VLAN transfers a packet received from outside the switch at a community port to all of the promiscuous ports, and also transfers the packet to the other community ports attached to that community VLAN. A community VLAN cannot transfer packets received from outside of the switch at a promiscuous port. A community VLAN is a one way connection from a community of ports to the promiscuous ports, but allows a packet received by one community port to be transmitted out of the switch, through the other community ports connected to that community VLAN.	VLAN connecting to a group of community ports, and also connecting to all of the promiscuous ports. The community VLAN transfers a packet received from outside the switch at a community port to all of the promiscuous ports, and also transfers the packet to the other community ports attached to that community VLAN. A community VLAN cannot transfer packets received from outside of the switch at a promiscuous port. A community VLAN is a one way connection from a community of ports to the promiscuous ports, but allows a packet received by one community port to be transmitted out of the switch, through the other community ports connected to that community VLAN.	VLAN connecting to a group of community ports, and also connecting to all of the promiscuous ports. The group of community ports is referred to as a 'community' of community ports. The community VLAN transfers a packet received from outside the switch at a community port to all of the promiscuous ports, and also transfers the packet to the other community ports attached to that community VLAN. A community VLAN cannot transfer packets received from outside of the switch at a promiscuous port. A community VLAN is a one way connection from a community of ports to the promiscuous ports, but allows a packet received by one community port to be transmitted out of the switch, through the other community ports connected to that community VLAN

The claim term "community VLAN" appears in asserted claim 21 of the '592 patent, as well as asserted claims 7 and 46 of the '145 patent. As proposed by Cisco, this term is construed to mean "VLAN connecting to a group of community ports, and also connecting to all or a subset of the promiscuous ports." Moreover, "[t]he group of community ports is referred to as a 'community' of community ports. The community VLAN transfers a packet received from outside the switch at a community port to all of the promiscuous ports, and also transfers the packet to the other community ports attached to that community VLAN. A community VLAN cannot transfer packets received from outside of the switch at a promiscuous port. A community VLAN is a one way connection from a community of ports to the promiscuous ports, but allows a packet received by one community port to be transmitted out of the switch, through the other community ports connected to that community VLAN." This construction is supported by the claim language and the specification.

As with the claim terms "primary VLAN" and "isolated VLAN" discussed above, the dispute among the parties with respect to the claim term "community VLAN" is whether the community VLAN connects to "all or a subset" of promiscuous ports, or to "all" promiscuous ports. For the reasons set forth above with respect to "primary VLAN," the construction adopted for "community VLAN" is correct and reflects the various embodiments described in the specification.

g. "switch" ('592 patent claims 6, 7, 20, and 21)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
Plain and ordinary meaning	a layer 2 (data link layer) device of the OSI reference model	No construction necessary. If construction is necessary, "a layer 2 (L2) switch"

The claim term "switch" appears in asserted claims 6, 7, 20, and 21 of the '592 patent. Based on the record evidence, it is determined that this claim language is unambiguous to a person having ordinary skill in the art, and that construction is therefore unnecessary. *See, e.g.*, *Summit 6, LLC v. Samsung Electronics Co., Ltd.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015) ("Because the plain and ordinary meaning of the disputed claim language is clear, the district court did not err by declining to construe the claim term."). This position is supported by both Cisco and the Staff. In particular, Cisco's expert Dr. Jeffay testified that the term "switch" is self-explanatory and has a plain and ordinary meaning in the field of computer networks. CX-0003C (Jeffay WS) at Q/A 88.

By contrast, the construction proposed by Arista is inconsistent with the patent specification, which discloses that the claimed invention can be implemented on both routers and switches. JX-0005 ('592 patent) at col. 6, lns. 8-14; col. 6, lns. 53-57; col. 7, lns. 13-16; col. 7, lns. 25-27; CX-1220C (Jeffay RWS) at Q/A 49; Jeffay Tr. 451-452. Dr. Jeffay testified that a person having ordinary skill in the art would understand the specification's references to a "switch" to mean that the device could have layer 3/4 capabilities and would not be limited solely to layer 2 capabilities. CX-1220C (Jeffay RWS) at Q/A 49, Q/A 242; *see* Duda Tr. 776-777.

h. "VLAN" ('592 patent claims 20 and 21; '145 patent claims 5, 7, 45, and 46)

Complainant Cisco's Proposed Construction	**Respondent Arista's Proposed Construction**	**Staff's Proposed Construction**
virtual local area network	a virtual local area network at layer two of the OSI reference model whereby packets exchanged between members of a given VLAN are transferred at the data link layer (layer two) of the OSI reference model and packets exchanged between VLANs are routed at the network layer (layer three) of the OSI reference model	virtual local area network defined within the switch

The claim term "VLAN" appears in asserted claims 20 and 21 of the '592 patent, as well as in asserted claims 5, 7, 45, and 46 of the '145 patent. As proposed by Cisco, this claim term is construed to mean "virtual local area network." This construction reflects the plain and ordinary mean of the term as understood by a person having ordinary skill in the art.[35]

As Cisco's expert Dr. Jeffay testified, the term "VLAN" should be construed to take its plain and ordinary meaning in the field of computer networks, which is "virtual local area network." CX-0003C (Jeffay WS) at Q/A 92; Jeffay Tr. 451, 516. This is supported by the specification where it states that a VLAN is a virtual local area network. JX-0005 ('592 patent) at col. 1, lns. 7-10 ("The invention relates to Virtual Local Area Networks (VLANs)."); CX-0003C (Jeffay WS) at Q/A 93.

Arista's proposed construction for the term "VLAN" adds additional limitations with respect to the operation of the VLAN that are not supported by the claim language or the specification. *See* CX-0003C (Jeffay WS) at Q/A 95.

Accordingly, the claim term "VLAN" is construed to mean "virtual local area network."

i. "VLAN configured as a one way connection" ('592 patent claims 20 and 21)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "a VLAN configured as a one-way path"	a VLAN configured as a one way path inside the switch	No construction necessary. If construction is necessary, "a VLAN configured as a one-way path"

[35] The construction proposed by the Staff is similar to the adopted construction, although the Staff's construction adds the phrase "within the switch." As discussed above with respect to the claim term "promiscuous port," adoption of this additional phrase is not warranted by the intrinsic evidence.

The claim term "VLAN configured as a one way connection" appears in asserted claims 20 and 21 of the '592 patent. Both Cisco and the Staff argue that no construction is needed for the claim term. If, however, it is determined that construction is necessary, Cisco and the Staff both propose that the term be construed to mean "a VLAN configured as a one-way path." *See* CX-0003C (Jeffay WS) at Q/A 96-97; Staff Br. at 92. Arista's proposed construction for this claim term adds a limitation that the "path" be "inside the switch," which is incorrect for the reasons discussed above in connection with the claim term "promiscuous port."

It is determined that the meaning of the claim term "VLAN configured as a one way connection" is unambiguous and does not require construction.

j. "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch" ('592 patent claim 6)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. See construction of "isolated port" and "promiscuous port."	Indefinite	No construction necessary. If construction necessary "the isolated port exchanges packets with the promiscuous port through a path inside the switch"

The claim term "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch" appears in asserted claim 6 of the '592 patent. Both Cisco and Staff agree that no construction of this term is required, and that it should have its plain and ordinary meaning. *See* CX-0003C (Jeffay WS) at Q/A 100; Staff Br. at 92. Arista argues that the term is indefinite. *See* RX-3136C (Moisand WS) at Q/A 407. Arista's invalidity argument is rejected, and is discussed in further detail below in the validity section addressing Arista's argument that certain claim elements are indefinite because they are "circular."

It is therefore determined that the claim term "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch" is unambiguous and does not require construction.

k. "said isolated port not exchanging packets with another isolated port" ('592 patent claim 6)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. See construction of "isolated port."	Indefinite	No construction necessary. See construction of "isolated port."

The claim term "said isolated port not exchanging packets with another isolated port" appears in asserted claim 6 of the '592 patent.

Both Cisco and Staff agree that no construction of this term is required, and that it should have its plain and ordinary meaning. *See* CX-0003C (Jeffay WS) at Q/A 103; Staff Br. at 93. Arista argues that the term is indefinite. *See* RX-3136C (Moisand WS) at Q/A 409. Arista's invalidity argument is rejected, and is discussed in further detail below in the validity section addressing Arista's argument that certain claim elements are indefinite because they are "circular."

It is therefore determined that the claim term "said isolated port not exchanging packets with another isolated port" is unambiguous and does not require construction.

l. "each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network, each port of said community of ports exchanging packets through a path internal to said switch with said promiscuous port, and said each port of said community of ports exchanging packets with all ports of said plurality of community ports through a path within said switch, and said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch" ('592 patent claim 7)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. See construction of "community port" and "promiscuous port"	Indefinite	No construction necessary. See construction of "community port" and "promiscuous port"

The claim term "each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network, each port of said community of ports exchanging packets through a path internal to said switch with said promiscuous port, and said each port of said community of ports exchanging packets with all ports of said plurality of community ports through a path within said switch, and said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch" appears in asserted claim 7 of the '592 patent.

Both Cisco and Staff agree that no construction of this term is required, and that it should have its plain and ordinary meaning. *See* CX-0003C (Jeffay WS) at Q/A 106; Staff Br. at 93. Arista argues that the term is indefinite. *See* RX-3136C (Moisand WS) at Q/A 407. Arista's invalidity argument is rejected, and is discussed in further detail below in the validity section addressing Arista's argument that certain claim elements are indefinite because they are "circular."

It is therefore determined that the claim term "each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network, each port of said community of ports exchanging packets through a path internal to said switch with said promiscuous port, and said each port of said community of ports exchanging packets with all ports of said plurality of community ports through a path within said switch, and said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch" is unambiguous and does not require construction.

m. "said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch" ('592 patent claim 7)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. See construction of "community port."	Indefinite	No construction necessary. If construction is necessary, "none of the community ports exchanges packets with any other port." See, also, construction of "community port."

The claim term "said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch" appears in asserted claim 7 of the '592 patent.

Both Cisco and Staff agree that no construction of this term is required, and that it should have its plain and ordinary meaning. *See* CX-0003C (Jeffay WS) at Q/A 109; Staff Br. at 94. Arista argues that the term is indefinite. *See* RX-3136C (Moisand WS) at Q/A 409. Arista's invalidity argument is rejected, and is discussed in further detail below in the validity section addressing Arista's argument that certain claim elements are indefinite because they are "circular."

It is therefore determined that the claim term "said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch" is unambiguous and does not require construction.

n. "router" ('145 patent claims 5, 7, 45, and 46)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
Plain and ordinary meaning	a layer 3 (network layer) device of the OSI reference model	a layer 3 (network layer) device of the OSI reference model to which promiscuous ports are connected

The claim term "router" appears in asserted claims 5, 7, 45, and 46 of the '145 patent. Based on the record evidence, it is determined that this claim language is unambiguous to a person having ordinary skill in the art, and that construction is therefore unnecessary. *See, e.g.*, *Summit 6*, 802 F.3d at 1291. In particular, Cisco's expert Dr. Jeffay testified that the term "router" is self-explanatory and has a plain and ordinary meaning in the field of computer networks. CX-0003C (Jeffay WS) at Q/A 117.

The construction proposed by Arista is inconsistent with the patent specification, which discloses that the claimed invention can be implemented on both routers and switches. JX-0005

('592 patent) at col. 6, lns. 8-14; col. 6, lns. 53-57; col. 7, lns. 13-16; col. 7, lns. 25-27; CX-1220C (Jeffay RWS) at Q/A 49; Jeffay Tr. 451-452. Accordingly, Dr. Jeffay testified that a person having ordinary skill in the art would understand the specification's references to a "switch" to mean that the device could have layer 3/4 capabilities and would not be limited solely to layer 2 capabilities. CX-1220C (Jeffay RWS) at Q/A 49, Q/A 242; *see* Duda Tr. 776-777.

Moreover, the construction proposed by Arista and the Staff limits the invention to a "layer 3 (network layer) device of the OSI reference model." Such a limitation belies the fact that a person of ordinary skill in the art would understand the term "router" to mean any device with routing capabilities, and not only a layer 3 device. *See* CX-0003C (Jeffay WS) at Q/A 119. Moreover, not every layer 3 device is a router, and Arista's proposed construction would capture devices which are not routers. *See id.*

o. "first VLAN" ('145 patent claims 5 and 45)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "a VLAN"	a primary VLAN	No construction necessary. If construction is necessary, "a VLAN"

The claim term "first VLAN" appears in asserted claims 5 and 45 of the '145 patent. Both Cisco and the Staff agree that this term does not require construction and should take its plain and ordinary meaning. *See* Compl. Br. at 236-37; Staff Br. at 95. In particular, it is argued that nothing in the claims or the specification of the '145 patent suggests that use of the word "first" has any special meaning. *See* Compl. Br. at 236. Indeed, Cisco's expert Dr. Jeffay testified that the term is self-explanatory and is fully defined in the remainder of the relevant claim as a VLAN for "receiving packets from the shared network and transferring them to a designated user port, the first VLAN rejecting packets from the user ports." CX-0003C (Jeffay WS) at Q/A 122. Although the "first VLAN" may be a primary VLAN, nothing in the claims or the specification limits it to only a primary VLAN. *Id.*

It is therefore determined that the claim term "first VLAN" is unambiguous, does not require construction, and is not limited to only "a primary VLAN."

p. "second VLAN" ('145 patent claims 5 and 45)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "a VLAN other than the first VLAN"	a VLAN including either an isolated VLAN or community VLAN	No construction necessary. If construction is necessary, "a VLAN other than the first VLAN"

The claim term "second VLAN" appears in asserted claims 5 and 45 of the '145 patent. Both Cisco and the Staff agree that this term does not require construction and should take its plain and ordinary meaning. *See* Compl. Br. at 237-38; Staff Br. at 95. In particular, it is argued that nothing in the claims or the specification of the '145 patent suggests that use of the word "second" has any special meaning. *See* Compl. Br. at 237. Indeed, Cisco's expert Dr. Jeffay testified that the term is self-explanatory and is fully defined in the remainder of the relevant claim as a VLAN for ""receiving packets from the user ports and transferring them to the port connected to the shared network, the second VLAN preventing transfer of packets from one of the user ports to other user ports, and the second VLAN also rejecting packets from the shared network, in order to separate packet traffic of different users." CX-0003C (Jeffay WS) at Q/A

125. Although the "second VLAN" may be an isolated or a community VLAN, nothing in the claims or the specification limits it to such. *Id.*

It is therefore determined that the claim term "second VLAN" is unambiguous, does not require construction, and is not limited to only an isolated VLAN or a community VLAN.

B. Literal Infringement Analysis

As discussed in further detail on a claim-by-claim basis below, the record evidence establishes that Arista's products infringe all asserted claims of the Private VLAN Patents under the adopted claim constructions. In particular each Accused Private VLAN Product contains the elements of the claim inventions, including promiscuous ports and associated primary VLANs, isolated ports and associated isolated VLANs, and community ports and associated community VLANs. Cisco's expert Dr. Jeffay, who analyzed Arista's technical documents, source code, and witness testimony, and who performed his own independent testing, testified that the Accused Private VLAN Products infringe the asserted claims of the Private VLAN Patents. Testimony given by Arista's fact witness Gagan Arneja and Arista's expert witness Mr. Moisand also supports a finding of infringement.

Arista's noninfringement position centers on the argument that VLAN's are "virtual" and therefore cannot process packets as required by the asserted claims. *See* Resp. Br. at 314-28. Nevertheless, the record evidence demonstrates that the VLAN's in the Accused Private VLAN Products are more than a virtual construct and implement the claimed inventions. In particular, the evidence shows that Arista's products contain physical structures and software elements that satisfy the elements of the asserted claims.

1. ’592 Patent – Claim 6

a. A switch, comprising:

The record evidence shows that the Accused Private VLAN Products satisfy this claim limitation under the construction adopted above. Specifically, the accused products are devices with switching capabilities. They also satisfy this claim limitation under the other constructions proposed by the parties because they are layer 2 (data link layer) devices and layer 2 (L2) switches. *See* CX-0003C (Jeffay WS) at Q/A 146; CX-0075 at 46; CX-0076 at 1.

b. a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network;

The Accused Private VLAN Products have a “[ ]” feature that satisfies this claim limitation under the claim constructions adopted above.[36] In particular, the [ ] in the Arista products exchange packets with isolated and community ports by use of VLANs. Moreover, the [ ] feature also satisfy this claim limitation under the claim constructions proposed by the other parties, inasmuch as Arista’s [ ], including primary, isolated, and community VLANS, for transmission and receipt of packets. *See* CX-0003C (Jeffay WS) at Q/A 190-201, Q/A 175-184, Q/A 276; CX-0031C at 3; CX-0034C at 1; CX-0036C at 179; CX-0044C at 1; CX-0045C at 50; CX-0048C at 94; CX-0047C at 81; CX-0948C at 7; CX-0026C at 137-39. In addition, Arista’s [ ] receive incoming packets from an external network, and transmit outgoing packets to said external network, as shown, for example, by Dr. Jeffay’s test results. *See, e.g.*, CX-0003C (Jeffay WS) at Q/A 175-184, Q/A 276.

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[36] The [ ].” *See, e.g.*, CX-0075 at 763.

In particular, Dr. Jeffay testified:

> The tests that I performed on Arista's 7150S-52-CL switch confirmed that Arista's private VLAN feature behaves as described by the '592 and '145 patents and as claimed by the asserted claims. Specifically, in Arista's private VLAN implementation, a [ ], which is the claimed promiscuous port, can communicate with isolated ports and community ports. Isolated ports cannot communicate with each other but can communicate with the promiscuous port, and community ports can communicate with each other and the promiscuous port but not with the isolated ports. The tests also show that the primary, isolated, and community VLANs all allow only one-way connections between promiscuous ports and isolated and community ports.

CX-0003C (Jeffay WS) at Q/A 178.

Dr. Jeffay further testified:

> The tests that I described show that an isolated port can send packets to promiscuous ports but not to community ports. It also shows that isolated VLAN is a one way connection from isolated ports to promiscuous ports, because when I used a VLAN tag that did not match the isolated VLAN tag the packets were rejected. . . . I tested all types of ports and all types of VLANs on the Arista switch and the tests shows that all VLANs are one-way connections and behave as described by the asserted claims of the '592 and '145 patents.

CX-0003C (Jeffay WS) at Q/A 180-181.

The testimony of Arista's witness Mr. Arneja confirms that this claim element is satisfied by Arista's [ ]:

> [
>
>].

JX-0019C (Arneja Dep. Tr.) 46; *see* Arneja Tr. 1123-1124.

c. **and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network,**

The Accused Private VLAN Products have an "isolated ports" feature that satisfies this claim limitation under the claim constructions adopted above.[37] The isolated ports in the accused products exchange packets with promiscuous ports by use of VLANS, but cannot transfer packets to other isolated ports. In addition, the accused products satisfy this claim limitation even under the claim constructions proposed by the other parties because the isolated ports are physical ports that can be connected to user devices and exchange packets with promiscuous ports using VLANs internal to the switch, including primary and isolated VLANs. *See* Arneja Tr. 1124-1125; Moisand Tr. 1187; CX-0003C (Jeffay WS) at Q/A 175-184; Q/A 202-206, Q/A 277; CX-0031C at 3; CX-0032C at 54; CX-0033C at 2-3; CX-0034C at 1; CX-0036C at 179; CX-0044C at 1; CX-0045C at 50; CX-0047C at 81; CX-0048C at 94; CX-0075 at 763; CX-0948C at 7; CX-0026C at 137-39; JX-0036C (Sweeney Dep. Tr.) 131; 133; JX-0028C (Kaza Dep. Tr.) 54; JX-0019C (Arneja Dep. Tr.) 58; JX-0033C (Sadana Dep. Tr.) 99-100, 100-101, 101, 105-106. Moreover, Arista's isolated ports can connect to a private network and receive and transfer packets to that private network as shown, for example, by Dr. Jeffay's test results. *See, e.g.*, CX-0003C (Jeffay WS) at Q/A 277.

The testimony of Arista's witness Mr. Arneja confirms that this claim element is satisfied by Arista's isolated ports. For example, Mr. Arneja testified that [

]:

[37] The ports are sometimes referred to as "isolated VLAN ports." *See, e.g.*, CX-0075 at 763.

[

].

JX-0019C (Arneja Dep. Tr.) 58; *see* Arneja Tr. 1124-1125.

d. said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port.

The Accused Private VLAN Products have "isolated ports" and "isolated VLANs" that satisfy this claim limitation under the claim constructions adopted above. As described above with respect to the "and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network" claim limitation, Arista's isolated ports also satisfy this claim limitation under the constructions proposed by the other parties. Further, Arista's isolated ports exchange packets with promiscuous ports via an isolated VLAN, which is a path inside the switch, and cannot exchange packets with other isolated ports. *See* Arneja Tr. 1136; Moisand Tr. 1187-1188; CX-0003C (Jeffay WS) at Q/A 170, Q/A 175-184, Q/A 231-236, Q/A 277; CX-0031C at 3, 5; CX-0032C at 55; CX-0033C at 2-3; CX-0034C at 2; CX-0036C at 179; CX-0044C at 1; CX-0045C at 50; CX-0047C at 81; CX-0048C at 91; CX-0075 at 763; CX-0948C at 7; CX-0026C at 137-9; JX-0028C (Kaza Dep. Tr.) 50; JX-0036C (Sweeney Dep. Tr.) 131, 133, 377-378, 386-387; JX-0019C (Arneja Dep. Tr.) 53, 58, 83-84; CX-1200C at 48, 50, 52, 54; and JX-0033C (Sadana Dep. Tr.) 97, 98.

Testimony adduced at the hearing demonstrates that the claim limitation is satisfied by the accused products. Specifically, Arista's expert Mr. Moisand testified that, [

]." Moisand Tr. 1182, 1187-1188. Arista's fact witness also testified that [

]:

[

].

JX-0019C (Arneja Dep. Tr.) 53; *see also* Arneja Tr. 1136-1138 ([

]).

This testimony is supported by documentary evidence in the form of Arista's EOS User Manual, which states that "[i]solated VLAN ports carry unidirectional traffic from host ports to primary VLAN ports," and that "[i]solated VLAN ports filter broadcast and multicast traffic (Layer 2) from all other ports in the same isolated VLAN." CX-0075 at 763.

2. '592 Patent – Claim 7

a. The switch of claim 6 further comprising:

As discussed above, the Accused Private VLAN Products meet all the limitations of claim 6 of the '592 patent.

b. a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network,

The evidence adduced at the hearing shows that the Accused Private VLAN Products have "community ports" that meet this claim element under the claim constructions adopted above.[38] Specifically, Arista's community ports exchange packets with promiscuous ports by using VLANs and transfer packets to a designated number of other community ports. The accused products also satisfy this claim limitation under the claim construction proposed by the other parties because Arista's community ports are physical ports that can be connected to user devices and exchange packets with promiscuous ports using VLANs internal to the switch, including primary and community VLANs. *See* Arneja Tr. 1125-1126; Moisand Tr. 1189-1190, 1190; CX-0003C (Jeffay WS) at Q/A 212-216, Q/A 175-184; CX-0031C at 3, 5; CX-0032C at 55; CX-0033C at 2-3; CX-0034C at 2; CX-0036C at 179; CX-0044C at 1; CX-0045C at 50; CX-0047C at 81; CX-0048C at 94; CX-0075 at 763; CX-0948C at 7; CX-0026C at 137-9; JX-0036C (Sweeney Dep. Tr.) 52; CX-1208C at 376-377, 385-386; JX-0019C (Arneja Dep. Tr.) 54, 58. Moreover, Arista's community ports receive and transmit packets onto an external network as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184, Q/A 279.

Testimony adduced at the hearing demonstrates that Arista's community ports satisfy this claim limitation. For example, Mr. Moisand testified with respect to Arista's community VLAN functionality: "[

---

[38] The ports are sometimes referred to as "community VLAN ports." *See, e.g.*, CX-0075 at 763.

].” Moisand Tr. 1189, 1190. In addition, Mr. Arneja testified that [ ]:

> [
>
>].

JX-0019C (Arneja Dep. Tr.) 58; *see* Arneja Tr. 1125-1126.

c. each port of said community of ports exchanging packets through a path internal to said switch with said promiscuous port, and said each port of said community of ports exchanging packets with all ports of said plurality of community ports through a path within said switch, and said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch.

The record evidence shows that the Accused Private VLAN Products have “community ports” and “community VLANs” that satisfy this claim limitation under the claim constructions adopted above. As described with respect to claim limitation “a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network” above, Arista’s community ports satisfy the claimed “community ports” limitation. In addition, Arista’s community ports satisfy this claim limitation under the constructions proposed by the other parties because they exchange packets with promiscuous ports and other designated community ports via a community VLAN, which is a path inside the switch, and do not exchange packets with any other ports (*e.g.*, an isolated port). *See* Arneja Tr. 1138-1139; Moisand Tr. 1189-1190, 1183-1184; CX-0003C (Jeffay WS) at Q/A 169, Q/A 175-184, Q/A 240-245, Q/A 280; CX-0031C at 3, 5; CX-0032C at 55; CX-0033C at 2-3; CX-0034C at 2; CX-0036C at 179; CX-0044C at 1; CX-0045C at 50; CX-0048C at 94; CX-0047C at 81; CX-0048C at 7; CX-0075 at 763; CX-0948C at 7; CX-0026C at 137-39; JX-0036C (Sweeney Dep. Tr.) 52; CX-1208C at 376-377, 385-386; JX-0019C (Arneja Dep. Tr.) 54, 58; JX-0033C (Sadana Dep. Tr.) 97, 98.

Testimony adduced at the hearing demonstrates that the community ports and community VLANs of the accused products satisfy this claim limitation. For example, Mr. Moisand testified regarding Arista's community VLAN functionality: "[

]."

Moisand Tr. 1183-1184, 1190. Mr. Arneja also testified that [

]:

> [
>
>].

JX-0019C (Arneja Dep. Tr.) 54; *see* Arneja Tr. 1138-1139.

This testimony is supported by documentary evidence in the form of Arista's EOS User Manual, which states that "[c]ommunity VLAN ports carry traffic from host ports to the primary VLAN ports and to other host ports in the same community VLAN." CX-0075 at 763.

3. '592 Patent – Claim 20

a. A switch implementing virtual local area networks (VLANs) in a computer network, comprising:

For the reasons set forth above with respect to the limitation "A switch, comprising" from claim 6, the record evidence shows that the Accused Private VLAN Products satisfy this claim limitation under the adopted claim constructions, as well as the constructions proposed by the other parties.

b. a first isolated port assigned to a user to receive said user's packet from an external circuit connected to said first isolated port;

For the reasons set forth above with respect to the limitation "and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network" from claim 6, the Accused Private VLAN Products satisfy this claim limitation under the adopted claim constructions, as well as the constructions proposed by the other parties. In addition, Arista's isolated ports receive packets from an external circuit in a computer connected to the isolated port as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184.

c. and a selected promiscuous port to receive said packet through an isolated VLAN, said packet to be transferred to an external circuit connected to said promiscuous port,

The record evidence demonstrates that the Accused Private VLAN Products have "[ ]" and "isolated VLANs" that satisfy this claim limitation under the claim constructions adopted above, as well as under the constructions proposed by the other parties. In particular, Arista's [ ] satisfy the limitations of the claimed "promiscuous port" element. Arista's isolated VLANs also meet the claimed "isolated VLAN" element because they are a VLAN that is a one-way connection from isolated ports to promiscuous ports that receives packets from isolated ports and transfers them to promiscuous ports, but that cannot carry packets received by a promiscuous port and cannot delivery packets to another isolated port. *See* Arneja Tr. 1136-1138; Moisand Tr. 1187-1188; CX-0003C (Jeffay WS) at Q/A 170, Q/A 175-184, Q/A 232-236; CX-0031C at 3, 5; CX-0032C at 55; CX-0033C at 2, 3; CX-0034C at 2; CX-0036C at 179; CX-0045C at 50; CX-0047C at 81; CX-0048C at 94; CX-0044C at 1;

CX-0075 at 763; CX-0948C at 7; CX-0026C at 137-39; JX-0036C (Sweeney Dep. Tr.) 131, 133, 377-378, 386-387; JX-0019C (Arneja Dep. Tr.) 53, 83-84, 58; CX-1200C at 48, 50, 52, 54; JX-0028C (Kaza Dep. Tr.) 50; JX-0033C (Sadana Dep. Tr.) 99-100, 100-101, 101, 105-106. In addition, Arista's [ ] receive packets through an isolated VLAN and transfer them to an external circuit as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-183.

Testimony adduced at the hearing demonstrates that this claim element is met by Arista's [ ] and isolated VLANs. For example, Mr. Arneja testified that [

]:

> [
>
>].

JX-0019C (Arneja Dep. Tr.) 53; *see also* Arneja Tr. 1136-1137 ([

]).

This testimony is supported by documentary evidence in the form of Arista's EOS User Manual, which states that "[i]solated VLAN ports carry unidirectional traffic from host ports to primary VLAN ports," and that "[i]solated VLAN ports filter broadcast and multicast traffic (Layer 2) from all other ports in the same isolated VLAN." CX-0075 at 763.

d. said isolated VLAN configured as a one way connection from all isolated ports to all promiscuous ports and also configured to prevent any other isolated port from receiving said user's packets from said isolated VLAN,

For the reasons set forth above with respect to the limitation "and a selected promiscuous port to receive said packet through an isolated VLAN, said packet to be transferred to an external circuit connected to said promiscuous port," the record evidence shows that the Accused Private VLAN Products satisfy this claim limitation under the adopted claim constructions, as well as the other constructions proposed by the parties. In addition, Arista's isolated VLANs are configured as a one way connection from isolated ports to promiscuous ports and prevent other isolated ports from receiving packets from the isolated VLAN as described above with respect to the claim 6 element "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port." This is further demonstrated, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184.

e. said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports.

The record evidence shows that the Accused Private VLAN Products have "[ ]" and primary "VLANs" satisfy this claim limitation under the adopted constructions, as well as the constructions proposed by the other parties. As discussed with respect to the claim 6 limitation "a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network," Arista's [ ] meet the limitations of all constructions of the claimed "promiscuous ports" element. Arista's primary VLANs also meet the claimed "primary VLAN" element under all constructions because they are a VLAN that is a one way connection from promiscuous ports to isolated and community ports which receive packets from promiscuous ports and transfer them to isolated and community ports, but which cannot receive and transfer packets from isolated or community ports. *See* CX-0003C (Jeffay WS) at Q/A 168, Q/A 175-184, Q/A 223-227, Q/A 283; Arneja Tr. 1132-1135; Moisand Tr. 1182-1183, 1185-1186; CX-0031C at 3, 5; CX-0032C at 55; CX-0033C at 2, 3; CX-0034C at 2; CX-0036C at 179; CX-0045C at 50; CX-0047C at 81; CX-0048C at 94; CX-0044C at 1; CX-0075 at 763; CX-0948C at 7; CX-0026C at 137-39.

Testimony adduced at the hearing shows that this claim limitation is satisfied by Arista's [ ] and primary VLAN. For example, Arista's technical expert Mr. Moisand testified that, [

]:

> [
>
>].

Moisand Tr. 1186.

Mr. Arneja also testified that [

]:

> [
>
>].

JX-0019C (Arneja Dep. Tr.) 48; *see also* Arneja Tr. 1132-1135 ([

]).

This testimony is supported by documentary evidence in the form Arista's EOS User Manual, which states that "[a] primary VLAN defines the entire broadcast domain," and that "[p]rimary VLAN ports community with secondary VLAN ports and ports external to the private VLAN." CX-0075 at 763.

4. ’592 Patent – Claim 21

a. A switch implementing virtual local area networks (VLANs) in a computer network, comprising:

For the reasons set forth above with respect to the limitation “A switch, comprising” from claim 6, the record evidence shows that the Accused Private VLAN Products satisfy this claim limitation under the adopted claim constructions, as well as the constructions proposed by the other parties.

b. a plurality of community ports, including a first community port assigned to a user to receive said user's packet from an external circuit connected to said first community port;

The Accused Private VLAN Products have “community ports” that satisfy this claim limitation under all claim for the reasons discussed above with respect to the claim 7 limitation “a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network.” In addition, Arista’s community ports receive packets from an external circuit connected to the community port as shown, for example, by Dr. Jeffay’s test results. CX-0003C (Jeffay WS) at Q/A 175-184.

c. and a plurality of promiscuous ports connected to external circuits

For the reasons discussed above with respect to the claim 6 element “a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network,” the record evidence shows that the Accused Private VLAN Products satisfy this claim limitation under all claim constructions.

d. **to receive said packet through a community VLAN, all other community ports connected to said community VLAN also receiving said packet, but not any other ports of said switch, said community VLAN configured as a one way connection from all community ports in said community VLAN to all promiscuous ports,**

The adduced evidence shows that the Accused Private VLAN Products have "community ports" and "community VLANs" that satisfy this claim limitation under all constructions. As discussed with respect to the claim 7 limitation "a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network," Arista's community ports satisfy the limitations of all constructions of the claimed "community ports" element. Arista's community VLANs also satisfy the claimed "community VLAN" limitation under all constructions because they are a VLANs that are one way connections from a community of ports to promiscuous ports that transfer packets from a community of ports to promiscuous ports and also to other community ports attached to the community VLAN, but that cannot transfer packets received by a promiscuous port. Arneja Tr. 1138-1139, 1139; Moisand Tr. 1189-1190; 1190, 1183-1184; CX-0003C (Jeffay WS) at Q/A 169, Q/A 175-184, Q/A 241-245; CX-0031C at 3, 5; CX-0032C at 55; CX-0033C at 2-3; CX-0034C at 2; CX-0036C at 179; CX-0044C at 1; CX-0045C at 50; CX-0048C at 94; CX-0047C at 81; CX-0048C at 7; CX-0075 at 763; CX-0948C at 7; CX-0026C at 137-39; JX-0019C (Arneja Dep. Tr.) 54, 58; JX-0028C (Kaza Dep. Tr.) 52; JX-0036C (Sweeney Dep. Tr.) 376-377, 385-386; JX-0033C (Sadana Dep. Tr.) 97, 98.

Testimony adduced at the hearing demonstrates that this claim limitation is satisfied by Arista's [ ] and primary VLAN. For example, Mr. Moisand testified that, [

]:

[

].

Moisand Tr. 1190.

Mr. Arneja also testified that [

]:

[

].

JX-0019C (Arneja Dep. Tr.) at 54; *see also* Arneja Tr. 1132-1134 (same), 1139 ([

]).

This testimony is supported by documentary evidence in the form of Arista's EOS User Manual, which states that "[c]ommunity VLAN ports carry traffic from host ports to the primary VLAN ports and to other host ports in the same community VLAN." CX-0075 at 763.

e. said all promiscuous ports also connected via a one way primary VLAN to all community ports

As discussed above with respect to the claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports," the evidence shows that the Accused Private VLAN Products satisfy this limitation under all claim constructions.

5. ’145 Patent – Claim 5

a. A router, comprising:

The record evidence demonstrates that the Accused Private VLAN Products meet the plain and ordinary meaning of “router” as adopted above because all of Arista’s products are devices with routing capabilities. The accused products also satisfy this limitation under the constructions proposed by Arista and the Staff because they are layer 3 (network layer) devices of the OSI reference model. CX-0003C (Jeffay WS) at Q/A 146; CX-1220C (Jeffay RWS) at Q/A 17; CX-0076 at 1; CX-0075 at 45; *see* Duda Tr. 776.

b. a port connected to a shared network;

The evidence shows that the “[ ]” of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the ’592 patent claim 6 limitation “a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network.”

c. a plurality of user ports;

The evidence shows that the “isolated ports” of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the ’592 patent claim 6 limitation “and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network.”

d. a first VLAN from the port connected to the shared network to the plurality of user ports, the first VLAN to receive packets from the shared network and transferring them to a designated user port, the first VLAN to reject packets from the user ports;

The evidence shows that the "primary VLAN" of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '592 patent claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports."

e. a second VLAN from the plurality of user ports, the second VLAN to receive packets from the user ports and transferring them to the port connected to the shared network, the second VLAN to prevent transfer of packets from one of the user ports to other user ports, and the second VLAN also to reject packets from the shared network, in order to separate packet traffic of different users.

The evidence shows that the "isolated VLAN" of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '592 patent claim 6 limitation "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port."

6. '145 Patent – Claim 7

a. A router, comprising:

The record evidence demonstrates that the Accused Private VLAN Products meet the plain and ordinary meaning of "router" as adopted above because all of Arista's products are devices with routing capabilities. The accused products also satisfy this limitation under the constructions proposed by Arista and the Staff because they are layer 3 (network layer) devices of the OSI reference model. CX-0003C (Jeffay WS) at Q/A 146; CX-1220C (Jeffay RWS) at Q/A 17; CX-0076 at 1; CX-0075 at 45; *see* Duda Tr. 776.

b. one or more promiscuous ports;

The evidence shows that the “[ ]” of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the ’592 patent claim 6 limitation “a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network.”

c. one or more isolated ports;

The evidence shows that the “isolated ports” of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the ’592 patent claim 6 limitation “and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network.”

d. one or more community ports;

The evidence shows that the “community ports” of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the ’592 patent claim 6 limitation “a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network.”

e. **a primary VLAN, the primary VLAN to receive packets from outside of the router through the one or more promiscuous ports and to transfer the packets to a selected one of the one or more isolated ports and to transfer the packets to the one or more community ports, the primary VLAN to reject packets from the one or more isolated ports and to reject packets from the one or more community ports;**

The evidence shows that the "primary VLAN" of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '592 patent claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports." In addition, Arista's primary VLANs are configured to reject packets from the one or more isolated ports and community ports, as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184.

f. **an isolated VLAN, the isolated VLAN to receive packets from outside of the router through an isolated port of the one or more isolated ports and to transfer the packets to the one or more promiscuous ports, the isolated VLAN to prevent transfer of the packets from the isolated port to another isolated port of the one or more isolated ports, and the isolated VLAN to prevent transfer of the packets from the isolated port to the one or more community ports, and the isolated VLAN to reject packets from the one or more promiscuous ports;**

The evidence shows that the "isolated VLAN" of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '592 patent claim 6 limitation "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port." In addition, Arista's isolated VLANs are configured to reject packets from the one or more promiscuous ports, as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184.

g. **and a community VLAN, the community VLAN to receive packets from outside of the router at a community port of the one or more community ports and to transfer the packets to the one or more promiscuous ports and to transfer the packets to any other community ports, the community VLAN to prevent transfer of packets to the one or more isolated ports, the community VLAN to reject packets from the one or more promiscuous ports.**

The evidence shows that the "community VLAN" of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '592 patent claim 21 limitation "to receive said packet through a community VLAN, all other community ports connected to said community VLAN also receiving said packet, but not any other ports of said switch, said community VLAN configured as a one way connection from all community ports in said community VLAN to all promiscuous ports." In addition, Arista's community VLANs are configured to reject packets from the one or more promiscuous ports, as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184.

7. **'145 Patent – Claim 45**

a. **A computer readable medium containing executable program instructions for operating a router, the executable program instructions comprising program instructions configured to:**

The record evidence shows that the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '145 patent claim 5 limitation "A router, comprising." In addition, EOS is the operating system software on Arista's devices that controls the devices and provides an interface for configuration. CX-0003C (Jeffay WS) at Q/A 132-134; CX-0075 at 45.

b. establish a first VLAN from a port connected to a shared network to a plurality of user ports, the first VLAN to receive packets from the shared network and to transfer them to one or more of the user ports, the first VLAN to reject any packets received from the user ports;

The evidence shows that the "primary VLAN" of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '592 patent claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports." In addition, Arista's primary VLANs are configured to reject packets from the one or more isolated ports and community ports, as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184.

c. establish a second VLAN from the plurality of user ports, the second VLAN to receive packets from the user ports and to transfer them to the port connected to the shared network, the second VLAN to prevent transfer of packets from one of the user ports to other user ports, and the second VLAN also to reject packets from the shared network, to thereby separate packet traffic of different users.

The evidence shows that the "isolated VLAN" of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '592 patent claim 6 limitation "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port." In addition, Arista's isolated VLANs are configured to reject packets from the shared network, as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184.

8. '145 Patent – Claim 46

a. A computer readable medium containing executable program instructions for operating a router, the executable program instructions comprising program instructions configured to:

The record evidence shows that the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '145 patent claim 5 limitation "A router, comprising." In addition, EOS is the operating system software on Arista's devices that controls the devices and provides an interface for configuration. CX-0003C (Jeffay WS) at Q/A 132-134; CX-0075 at 45.

b. establish a primary VLAN, the primary VLAN to receive packets from outside of the router through the one or more promiscuous ports and to transfer the packets to one or more community ports, the primary VLAN to reject packets received from the one or more community ports;

The evidence shows that the "primary VLAN" and "community ports" of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the '592 patent claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports" and the '592 patent claim 7 limitation "a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network," respectively. In addition, Arista's primary VLANs are configured to reject packets from the one or more isolated ports and community ports, as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 175-184.

c. **and establish a community VLAN, the community VLAN to receive packets from outside the router on a community port of the one or more community ports and to transfer the packets to the one or more promiscuous ports and to transfer the packets to any other community ports of the one or more community ports, the community VLAN rejecting packets received from the one or more promiscuous ports.**

The evidence shows that the “community ports,” “community VLANs,” and “[ ]” of the Accused Private VLAN Products satisfy this claim limitation under all claim constructions for the reasons discussed above with respect to the ’592 patent claim 7 limitation “a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network,” the ’592 patent claim 7 limitation “each port of said community of ports exchanging packets through a path internal to said switch with said promiscuous port, and said each port of said community of ports exchanging packets with all ports of said plurality of community ports through a path within said switch, and said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch,” and the ’592 patent claim 6 limitation “a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network,” respectively.

In addition, Arista’s community VLANs are configured to reject packets received from the one or more promiscuous ports, as shown, for example, by Dr. Jeffay’s test results. CX-0003C (Jeffay WS) at Q/A 175-184.

9. Arista’s Non-Infringement Arguments

Arista raises several arguments in support of its position that the accused products do not infringe the asserted claims of the ’592 and ’145 patents. These arguments are addressed below.

a. Arista's Argument That Virtual LANs Do Not Process Packets

Arista introduces this non-infringement argument by first establishing that all asserted claims of the Private VLAN Patents require VLANs to process, receive, transmit, transfer, and reject packets. RX-3910C (Moisand RWS) at Q/A 34, Q/A 36, Q/A 90, Q/A 96; *see* Resp. Br. at 314. Arista then argues that, inasmuch as VLANs are abstract concepts that do not actually exist, and therefore cannot perform the claimed functions, there can be no infringement because Cisco has failed to identify the components that perform these functions. RX-3910C (Moisand RWS) at Q/A 10, Q/A 22; *see* Resp. Br. at 315-16. Arista's argument fails for the reasons set forth below.

As an initial matter, Arista's argument that VLANs are an "abstract concept" is directly contradicted by Arista's pre-litigation documents. In particular, Arista EOS User Manual specifically defines VLANs as "layer 2 structures" and refers to Arista's private VLANs as a "network structure." CX-0075 at 761, 762. This definition of VLANs as real, and not an abstract concept, is confirmed by the understanding of those skilled in the art. In particular, the 802.1Q-1998 standard itself defines a VLAN as "[a] subset of the active topology of a Bridged Local Area Network" where the "active topology" is "the set of communication paths formed by interconnecting the LANs and Bridges by the forwarding Ports." RX-0186 at 9, 30; CX-1220C (Jeffay RWS) at Q/A 19. Thus, as Dr. Jeffay testified, [ ]." Jeffay Tr. 517; *see* CX-0031C at 5; JX-0019C (Arneja Dep. Tr.) 56, 77, 79; JX-0036C (Sweeney Dep. Tr.) 382-383.

Arista's argument that VLANs cannot process, receive, transmit, transfer, or reject packets is also contradicted by Arista's own documents and fact witness testimony. For example, Mr. Arneja testified that [ ]. JX-0019C

(Arneja Dep. Tr.) 48; Arneja Tr. 1130-1132. Moreover, an Arista User Manual states that "[ ]." CX-0075 at 763. In addition, Arista's Private VLAN testing documents state that [ ]. CX-0031C at 4. Arista's technical documents and witness testimony are consistent with how those skilled in the art understand VLANs. CX-1220C (Jeffay RWS) at Q/A 228-234.

Testimony from Arista's witnesses also confirms that there are hardware and software structures in the Accused Private VLAN Products that implement the claimed functionality. In particular, Mr. Moisand testified several times that [ ]. Moisand Tr. 1192-1193. Mr. Arneja also testified [ ]:

> [ ].

Arneja Tr. 1153.

As Dr. Jeffay testified, the hardware and software structures identified by Mr. Moisand and Mr. Arneja implement the claimed VLANs. CX-0003C (Jeffay WS) at Q/A 228-234, Q/A 365. Indeed, the patents themselves identify ASIC switching chips, and software data structures such as Color Blocking Logic and assignment tables, as the means by which the claimed VLANs are created. JX-0005 ('592 patent) at col. 2, lns. 63-67; col. 6, lns. 3-17. Thus, Arista explicitly admits that it uses the hardware and software structures disclosed in the Private VLAN Patents to implement the accused private VLAN functionality on its products. Jeffay Tr. 517.

b. Arista's Argument That Its VLANs Are Not One-Way Connections

Arista also argues that there is no one-way connection between ports as required by the asserted claims because the path within its networking chips are the same regardless of the direction the packets are sent. RX-3910C (Moisand RWS) at Q/A 98-100; *see* Resp. Br. at 315-28. This argument discounts the evidence showing how traffic is handled when Private VLANs are configured, resulting in a one way connection between one type of port to another port using a specific VLAN. Thus, for example, [

]. CX-0003C (Jeffay WS) at Q/A 366, Q/A 176-184; CX-0075 at 763; JX-0019C (Arneja Dep. Tr.) 75, 81, 54; Arneja Tr. 1134-1135, 1135, 1136-1137, 1137-1138. [

]. JX-0019C (Arneja Dep. Tr.) 75, 81, 54; Arneja Tr. 1134-1135, 1135, 1136-1137, 1137-1138. These are thus one way connections, a fact reflected in an Arista User

Manual that states, "[i]solated VLAN ports carry unidirectional traffic from host ports to primary VLAN ports." CX-0075 at 763.

c. Arista's Argument That Its Isolated Ports Do Not Prevent the Exchange of Packets

With respect to claim 6 of the '592 patent, Arista argues that there is no infringement because its isolated ports can exchange packets through layer 3 forwarding. RX-3910C (Moisand RWS) at Q/A 112; *see* Resp. Br. at 328-30. Under Arista's theory there is no infringement because a packet can be exchanged from an isolated port to a promiscuous port, and then exit the device entirely using layer 3 forwarding to a different external device, where it would then be routed back to the original device and exchanged from the promiscuous port to another isolated port. Testimony adduced at the hearing, however, demonstrates that the forwarding behavior of such a hypothetical external device has nothing to do with the invention of the Private VLAN patents. Edsall Tr. 403-404. Moreover, even in the hypothetical situation proposed by Arista, the isolated ports still do not exchange with packets each other. Instead, the packets are exchanged to and from the promiscuous port using isolated and primary VLANs, respectively. CX-0003C (Jeffay WS) at Q/A 367; JX-0019C (Arneja Dep. Tr.) 56, 54.

d. Arista's Argument That Cisco Merely Relies on a Naming Convention

Arista also argues that Cisco relies mainly on Arista's use of terms such as "promiscuous," "isolated," and "community" to prove infringement. RX-3910C (Moisand RWS) at Q/A 11-13; *see* Resp. Br. at 330-31. Nevertheless, as discussed above, Cisco's proof of infringement is based on analysis of Arista's technical documents, source code, and witness testimony, as well as tests performed by Dr. Jeffay confirming the presence of the accused functionality in the accused products. Jeffay Tr. 505-506; CX-0003C (Jeffay WS) at Q/A 368. This defense, therefore, cannot succeed.

C. Indirect Infringement

1. Direct Infringement of the Private VLAN Patents in the United States

The record evidence shows that Arista's customers use private VLAN on the Accused Private VLAN Products in the United States, thereby infringing the private VLAN patents. CX-0003C (Jeffay WS) at Q/A 403; CX-0599. These customers include, for example, [ ]. CX-0003C (Jeffay WS) at Q/A 404-407; CPX-0241C; CX-0051C; CPX-0239C; CPX-0235C. The evidence shows that the accused Private VLAN functionality is configured and used by Arista's customers to meet each limitation of each of the asserted claims in the United States and, moreover, that [ ] Arista is aware of its customers' use of Private VLAN. *See, e.g.*, CX-0003C (Jeffay WS) at Q/A 408-414; CX-0962C; CPX-200C; CPX-0201C; CPX-0202C; CPX-0203C; CPX-0204C; CPX-0205C; CPX-0206C; CPX-0207C; CPX-0208C; CPX-0209C; CPX-0233C; CPX-0234C; CPX-0236C, CPX-0237C, CPX-0238C, CPX-0242C; CPX-0240C; JX-0033C (Sadana Dep. Tr.) 55-57, 77-78, 99-106, 110-111.

Arista argues that there cannot be direct infringement of the '537 patent at the time of importation because [ ]. *See, e.g.*, RX-3909C (Hollingsworth WS) at Q/A 132-145. Nevertheless, as discussed above in the section addressing importation issues, the record evidence shows that [ ]. This alone is sufficient to establish direct infringement at the time of importation. *See, e.g., Certain Absorbent Garments*, Inv. No. 337-TA-508, Order No. 16, 2004 WL 2251882, at *2 (Aug. 20, 2004). In addition, [

]. *See, e.g.*, CX-1349C (Benson WS) at Q/A 15, Q/A 21-27; Benson Tr. 1438-1439, 1454, 1456, 1460-1461. It was established that [

]. *See* Benson Tr. 1448.

2. Induced Infringement of the Private VLAN Patents

Arista is liable for inducing third parties to infringe the '592 and '145 patents. Arista knowingly induces infringement by encouraging, instructing, and enabling third parties to use the Accused Products in a manner that infringes the asserted claims of the '592 and '145 patents. *See, e.g.*, CX-0003C (Jeffay WS) Q/A 416-425. For example, Arista advertises private VLAN as a supported feature on the Accused Private VLAN Products, and Arista's User Manual describes in detail the private VLAN (private-vlan) commands, provides the command syntax and parameters, and includes an example of how to use the commands to configure private VLAN. CX-0075 (Arista User Manual EOS v. 4.14.3F at 768–69); CX-0076. Arista's witnesses testified that its users can configure these private VLAN functionalities using the commands provided by Arista. Moisand Tr. 1181-1184; *see* Jeffay Tr. 522.

Arista's sales and promotion of the switch hardware also induces infringement of the '592 and '145 patents because the hardware is designed to run the EOS software, which contains the infringing functionality. *See, e.g.*, Arneja Tr. 1153-1154; Duda Tr. 861; Metivier Tr. 1167, 1173; CX-0035C; JX-0026C (Duda Dep. Tr.) 204-207, 273-275; JX-0033C (Sadana Dep. Tr.) 110-111; CX-0003C (Jeffay WS) Q/A 388-402.

3. Contributory Infringement of the Private VLAN Patents

Arista is also liable for contributory infringement of the '592 and '145 patents. The components implicated in contributory infringement of the '592 and '145 patents are the Accused Products with EOS, which is a material part of the invention with no substantial noninfringing use. Arista's contention that [ ] does not absolve Arista of its contributory infringement liability. *See, e.g.*, CX-0003C (Jeffay WS) Q/A 384-387. Focusing on just the switch hardware as the infringing component, all asserted claims of the private VLAN patents refer to and require switch hardware, and thus switch hardware, [ ], is a material part of the invention described in the private VLAN patents. Arista's technical expert, Mr. Moisand, testified that all asserted claims of the '145 patent refer to "a router," and that all asserted claims of the '592 patent refer to "a switch." Moisand Tr. 1195.

The switch hardware has no substantial non-infringing uses because [ ]. *See, e.g.*, Arneja Tr. 1153-1154; CX-0003C (Jeffay WS) Q/A 388-402. In addition to Arista's User Manuals (*e.g.*, CX-0075), which discuss private VLAN in EOS, testimony from Arista executive Mr. Sadana confirmed that [ ]. JX-0033C (Sadana Dep. Tr.) 110-111. Moreover, Cisco has adduced [ ]. *See, e.g.*, Duda Tr. 861; Metivier Tr. 1167, 1173; CX-0035C; JX-0026C (Duda Dep. Tr.) 204-207, 273-275. [ ], also contribute to infringement because [

], and lack any actual substantial noninfringing use identified by Arista. *See, e.g.*, JX-0026C (Duda Dep. Tr.) 204-205; CX-0003C (Jeffay WS) Q/A 388-402.

D. Technical Prong of the Domestic Industry Requirement

As detailed below, the record evidence demonstrates that Cisco's Private VLAN DI Products practice the asserted claims of the '592 and '145 patents. Cisco's expert Dr. Jeffay testified that the technical prong of the domestic industry requirement has been satisfied based on analysis of Cisco's technical documentation and source code, as well as his own independent testing that verified the presence of the claimed functionality. CX-0003C (Jeffay WS) at Q/A 442-449, Q/A 498-499, Q/A 503-504, Q/A 513-516. Additionally, named inventor Mr. Edsall also testified as to the functionality of Cisco's Private VLAN DI Products. CX-0004C (Edsall WS) at Q/A 165-217.

1. '592 Patent – Claim 6

a. A switch, comprising:

The record evidence shows that the Cisco Private VLAN DI Products practice this claim limitation under all claim constructions. The Cisco products meet the plain and ordinary meaning of "switch" as adopted above because they are devices with switching capabilities. They also practice this limitation under the construction proposed by Arista and the Staff because they are layer 2 (data link layer) devices and layer 2 (L2) switches. CX-0003C (Jeffay WS) at Q/A 441-449, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062 at 1; CX-0067 at 1; CX-0068 at xlv; CX-0069 at 3; CX-0070; CX-0071 at 5; CX-0072 at 17-1; CX-0073 at 1-1; CX-0078 at 1; CX-0079 at 3; CX-0080 at 3; CX-0081 at 18-1; CX-0082 at 1-2.

b. a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network;

The evidence demonstrates that Cisco's Private VLAN DI Products have "promiscuous ports" that practice this claim limitation under all constructions. Applying the construction adopted above, this limitation is satisfied because Cisco's promiscuous ports exchange packets with isolated and community ports by use of VLANs. The limitation is also satisfied under the construction proposed by Arista and the Staff because Cisco's promiscuous ports are physical ports that can be connected to layer 3 or 4 devices and connect to VLANs internal to the switch, including primary, isolated, and community VLANs, for transmission and receipt of packets. *See* CX-0003C (Jeffay WS) at Q/A 447, Q/A 454-493, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062; CX-0067; CX-0068 at 15-2; CX-0069 at 21; CX-0070; CX-0071 at 59; CX-0072 at 24-3; CX-0073 at 20-2; CX-0078 at 25; CX-0079 at 27; CX-0080 at 43; CX-0081 at 44-4; CX-0082 at 16-2. In addition, Cisco's promiscuous ports are designed for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

c. and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network,

Cisco adduced evidence to show that the "isolated ports" of Cisco's Private VLAN DI Products practice this claim limitation under all proposed constructions. This limitation is satisfied under the claim constructions adopted above because Cisco's "isolated ports" exchange packets with promiscuous ports by use of VLANs, but cannot transfer packets to other isolated ports. This limitation is also satisfied under the claim constructions proposed by Arista and the Staff because the isolated ports are physical ports that can be connected to user devices and exchange packets with promiscuous ports using VLANs internal to the switch, including primary and isolated VLANs. *See* CX-0003C (Jeffay WS) at Q/A 448, Q/A 454-493, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062; CX-0067; CX-0068 at 15-2; CX-0069 at 21; CX-0070; CX-0071 at 59; CX-0072 at 24-3; CX-0073 at 20-2; CX-0078 at 25; CX-0079 at 27; CX-0080 at 43; CX-0081 at 44-4; CX-0082 at 16-2. In addition, Cisco's "isolated ports" can connect to a private network and receive and transfer packets to that private network as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

d. said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port.

The evidence shows that the "isolated ports" and "isolated VLANs" of Cisco's Private VLAN DI Products practice this claim limitation under all proposed constructions. As described above with respect to the limitation "and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network," Cisco's isolated ports meet this limitation. In addition, Cisco's isolated ports exchange packets with promiscuous ports via an isolated VLAN, which is a path inside the switch, and cannot exchange packets with other isolated ports. *See* CX-0003C (Jeffay WS) at Q/A 441-449, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062; CX-0067; CX-0068 at 15-3;

CX-0069 at 21; CX-0070; CX-0071 at 60; CX-0072 at 24-3; CX-0073 at 20-3; CX-0078 at 25; CX-0079 at 27; CX-0080 at 44; CX-0081 at 44-4; CX-0082 at 16-3. For example, Cisco's Layer 2 Switching Configuration Guide for Cisco Nexus 3000 Switch Series states that "[a]n isolated port is a host port that belongs to an isolated secondary VLAN. This port has complete isolation from other ports within the same PVLAN domain, except that it can communicate with associated promiscuous ports." CX-0069 at 21; *see* CX-0003C (Jeffay WS) at Q/A 483-489.

2. '592 Patent – Claim 7

a. The switch of claim 6 further comprising:

As discussed above, the Cisco Private VLAN DI Products practice all limitations of claim 6 of the '592 patent.

b. a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network,

The record evidence shows that the "community ports" of Cisco's Private VLAN DI Products practice this claim limitation under all proposed constructions. This limitation is satisfied under the adopted claim construction because Cisco's community ports exchange packets with promiscuous ports by use of VLANs and transfer packets to a designated number of other community ports. It is likewise satisfied under the construction proposed by Arista and the Staff because Cisco's community ports are physical ports that can be connected to user devices and exchange packets with promiscuous ports using VLANs internal to the switch, including primary and community VLANs. *See* CX-0003C (Jeffay WS) at Q/A 449, Q/A 454-493, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062; CX-0067; CX-0068 at 15-2; CX-0069 at 21; CX-0070; CX-0071 at 59; CX-0072 at 24-3; CX-0073 at 20-2; CX-0078 at 25; CX-0079 at 27; CX-0080 at 43; CX-0081 at 44-4; CX-0082 at 16-2. In addition, Cisco's community ports receive and transmit packets onto an external network as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

c. each port of said community of ports exchanging packets through a path internal to said switch with said promiscuous port, and said each port of said community of ports exchanging packets with all ports of said plurality of community ports through a path within said switch, and said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch.

Evidence adduced at the hearing demonstrates that the "community ports" and "community VLANs" of Cisco's Private VLAN DI Products practice this claim limitation under all constructions. As described above with respect to the "a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network" limitation, Cisco's "community ports" meet the limitations of all constructions of the claimed "community ports" element. In addition, Arista's community ports exchange packets with promiscuous ports and other designated community ports via a community VLAN, which is a path inside the switch, and do not exchange packets with any other ports (*e.g.*, an isolated port). CX-0003C (Jeffay WS) at Q/A 453, Q/A 454-493, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062; CX-0067; CX-0068 at 15-3; CX-0069 at 21; CX-0070; CX-0071 at 60; CX-0072 at 24-3; CX-0073 at 20-3; CX-0078 at 25; CX-0079 at 27; CX-0080 at 44; CX-0081 at 44-4; CX-0082 at 16-3. For example, Cisco's Layer 2 Switching Configuration Guide for Cisco Nexus 3000 Switch Series states:

> A community VLAN is a secondary VLAN that carries upstream traffic from the community ports to the promiscuous port and to other host ports in the same community . . . . The ports within one community can communicate, but these ports cannot communicate with ports in any other community or isolated VLAN in the private VLAN.

CX-0069 at 21.

This was also confirmed by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

3. '592 Patent – Claim 20

a. A switch implementing virtual local area networks (VLANs) in a computer network, comprising:

For the reasons discussed above with respect to the "A switch, comprising" limitation of claim 6, the Cisco Private VLAN DI Products practice this claim limitations under all constructions.

b. a first isolated port assigned to a user to receive said user's packet from an external circuit connected to said first isolated port;

As discussed in connection with the "and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network" limitation of claim 6, the evidence shows that the "isolated ports" of Cisco's Private VLAN DI Products meet this claim element under all proposed constructions. In addition, Cisco's isolated ports receive packets from an external circuit in a computer connected to the isolated port as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

c. and a selected promiscuous port to receive said packet through an isolated VLAN, said packet to be transferred to an external circuit connected to said promiscuous port,

The evidence of record establishes that Cisco's Private VLAN DI Products have "promiscuous ports" and "isolated VLANs" that practice this claim limitation under all constructions. As described above with respect to the claim 6 limitation "a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network," Cisco's promiscuous ports meet the limitations of all proposed constructions of the claimed "promiscuous port" element. Cisco's isolated VLAN also meets the claimed "isolated VLAN" element under all proposed constructions because it is a VLANs that is a one-way connection from isolated ports to promiscuous ports that receives packets from isolated ports and transfers them to promiscuous ports, but that cannot carry packets received by a promiscuous port and cannot delivery packets to another isolated port. *See* CX-0003C (Jeffay WS) at Q/A 441-449, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062; CX-0067; CX-0068 at 15-3; CX-0069 at 21; CX-0070; CX-0071 at 60; CX-0072 at 24-3; CX-0073 at 20-3; CX-0078 at 25; CX-0079 at 27; CX-0080 at 44; CX-0081 at 44-4; CX-0082 at 16-3. For example, Cisco's Layer 2 Switching Configuration Guide for Cisco Nexus 3000 Switch Series states:

> An isolated VLAN is a secondary VLAN that carries unidirectional traffic upstream from the hosts toward the promiscuous ports. You can configure only one isolated VLAN in a PVLAN domain. An isolated VLAN can have several isolated ports. The traffic from each isolated port also remains completely separate.

CX-0069 at 21.

In addition, Cisco's promiscuous ports receive packets through an isolated VLAN and transfer them to an external circuit as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

d. said isolated VLAN configured as a one way connection from all isolated ports to all promiscuous ports and also configured to prevent any other isolated port from receiving said user's packets from said isolated VLAN,

As discussed above with respect to the "and a selected promiscuous port to receive said packet through an isolated VLAN, said packet to be transferred to an external circuit connected to said promiscuous port" limitation, Cisco's Private VLAN DI Products practice this claim limitation under all proposed constructions. In addition, Cisco's isolated VLANs are configured as a one way connection from isolated ports to promiscuous ports and prevent other isolated ports from receiving packets from the isolated VLAN as described above with respect to the claim 6 limitation "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port." This is further demonstrated, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

e. said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports.

Cisco adduced evidence showing that Cisco's Private VLAN DI Products have "promiscuous ports" and "primary VLANs" that practice this claim limitation under all proposed constructions. As described with respect to the claim 6 limitation "a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network" above, Cisco's promiscuous ports meet the limitations of all proposed constructions of the claimed "promiscuous ports" element. Cisco's primary VLANs also meet the claimed "primary VLAN" element under all proposed constructions because they are a VLAN that is a one way connection from promiscuous ports to isolated and community ports which receive packets from promiscuous ports and transfer them to isolated and community ports, but which cannot receive and transfer packets from isolated or community ports. *See* CX-0003C (Jeffay WS) at Q/A 450-451, Q/A 454-493, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062; CX-0067; CX-0068 at 15-3; CX-0069 at 21; CX-0070; CX-0071 at 60; CX-0072 at 24-3; CX-0073 at 20-3; CX-0078 at 25; CX-0079 at 27; CX-0080 at 44; CX-0081 at

44-4; CX-0082 at 16-3. For example, Cisco's Layer 2 Switching Configuration Guide for Cisco Nexus 3000 Switch Series states that "[t]he primary VLAN carries traffic from the promiscuous ports to the host ports, both isolated and community, and to other promiscuous ports." CX-0069 at 21. The functionality of Cisco's primary VLANs is also confirmed by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

4. '592 Patent – Claim 21

a. A switch implementing virtual local area networks (VLANs) in a computer network, comprising:

For the reasons discussed above with respect to the "A switch, comprising" limitation of claim 6, the Cisco Private VLAN DI Products practice this claim limitations under all constructions.

b. a plurality of community ports, including a first community port assigned to a user to receive said user's packet from an external circuit connected to said first community port;

The evidence shows that the "community ports" of Cisco's Private VLAN DI Products practice this claim limitation under all proposed constructions for the reasons set forth above with respect to the claim 7 limitation "a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network." In addition, Cisco's community ports receive packets from an external circuit connected to the community port as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

c. and a plurality of promiscuous ports connected to external circuits

It has been shown that Cisco's Private VLAN DI Products meet this claim element under all proposed constructions for the same reasons given above for the claim 6 limitation "a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network."

d. to receive said packet through a community VLAN, all other community ports connected to said community VLAN also receiving said packet, but not any other ports of said switch, said community VLAN configured as a one way connection from all community ports in said community VLAN to all promiscuous ports,

The record evidence establishes that Cisco's Private VLAN DI Products have "community ports" and "community VLANs" that practice this claim limitation under all constructions. As described with respect to the claim 7 limitation "a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network" above, Cisco's community ports practice the "community ports" limitation under all constructions. Cisco's community VLANs further meet the claimed "community VLAN" limitation in this claim element under all constructions because they are a VLAN that is a one way connection from a community of ports to promiscuous ports which transfers packets from a community of ports to promiscuous ports and also to other community ports attached to the community VLAN, but which cannot transfer packets received by a promiscuous port. CX-0003C (Jeffay WS) at Q/A 453, Q/A 454-493, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0062; CX-0067; CX-0068 at 15-3; CX-0069 at 21; CX-0070; CX-0071 at 60; CX-0072 at 24-3; CX-0073 at 20-3; CX-0078 at 25; CX-0079 at 27; CX-0080 at 44; CX-0081 at 44-4; CX-0082 at 16-3. For example, Cisco's Layer 2 Switching Configuration Guide for Cisco Nexus 3000 Switch Series states:

> A community VLAN is a secondary VLAN that carries upstream traffic from the community ports to the promiscuous port and to other host ports

> in the same community . . . . The ports within one community can communicate, but these ports cannot communicate with ports in any other community or isolated VLAN in the private VLAN.

CX-0069 at 21.

The functionality of Cisco's community VLANs was also confirmed by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

e. said all promiscuous ports also connected via a one way primary VLAN to all community ports.

For the reasons discussed above with respect to the "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports" limitation of claim 20, the Cisco Private VLAN DI Products practice this claim limitations under all constructions.

5. '145 Patent – Claim 5

a. A router, comprising:

The record evidence shows that the Cisco Private VLAN DI Products practice this claim limitation under all claim constructions. Cisco's Private VLAN DI Products meet the plain and ordinary meaning of "router" adopted above because all of Cisco's products are devices with routing capabilities. They also satisfy this limitation under the constructions proposed by Arista and the Staff because they are layer 3 (network layer) devices of the OSI reference model. CX-0003C (Jeffay WS) at Q/A 441-449, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-1220C (Jeffay RWS) at Q/A 17; CX-0062 at 1; CX-0078 at 50; CX-0079 at 52; CX-0071 at 17; CX-0080 at 23; CX-0068 at xlv; CX-0073 at 1-1; CX-0082 at 1-14; CX-0081 at 1-13; CX-0072 at 30-2, 30-4; *see* Duda Tr. 776.

b. a port connected to a shared network;

Cisco's Private VLAN DI Products have "promiscuous ports" that practice this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 6 limitation "a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network" discussed above.

c. a plurality of user ports;

Cisco's Private VLAN DI Products have "isolated ports" that practice this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 6 limitation "and a plurality of isolated ports, a selected isolated port of said plurality of isolated ports connected to a selected private network, said selected isolated port receiving packets from said selected private network and transmitting packets onto said selected private network" discussed above.

d. a first VLAN from the port connected to the shared network to the plurality of user ports, the first VLAN to receive packets from the shared network and transferring them to a designated user port, the first VLAN to reject packets from the user ports;

Cisco's Private VLAN DI Products have a "primary VLAN" that practices this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports" discussed above.

e. a second VLAN from the plurality of user ports, the second VLAN to receive packets from the user ports and transferring them to the port connected to the shared network, the second VLAN to prevent transfer of packets from one of the user ports to other user ports, and the second VLAN also to reject packets from the shared network, in order to separate packet traffic of different users.

Cisco's Private VLAN DI Products have an "isolated VLAN" that practices this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 6 limitation "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port" discussed above.

6. '145 Patent – Claim 7

a. A router, comprising:

The record evidence shows that the Cisco Private VLAN DI Products practice this claim limitation under all claim constructions. Cisco's Private VLAN DI Products meet the plain and ordinary meaning of "router" adopted above because all of Cisco's products are devices with routing capabilities. They also satisfy this limitation under the constructions proposed by Arista and the Staff because they are layer 3 (network layer) devices of the OSI reference model. CX-0003C (Jeffay WS) at Q/A 441-449, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-1220C (Jeffay RWS) at Q/A 17; CX-0062 at 1; CX-0078 at 50; CX-0079 at 52; CX-0071 at 17; CX-0080 at 23; CX-0068 at xlv; CX-0073 at 1-1; CX-0082 at 1-14; CX-0081 at 1-13; CX-0072 at 30-2, 30-4; *see* Duda Tr. 776.

b. one or more promiscuous ports;

Cisco's Private VLAN DI Products have "promiscuous ports" that practice this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 6 limitation "a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network" discussed above.

c. one or more isolated ports;

Cisco's Private VLAN DI Products have "isolated ports" that practice this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 6 limitation "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port" discussed above.

d. one or more community ports;

Cisco's Private VLAN DI Products have "community ports" that practice this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 7 limitation "a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network" discussed above.

e. a primary VLAN, the primary VLAN to receive packets from outside of the router through the one or more promiscuous ports and to transfer the packets to a selected one of the one or more isolated ports and to transfer the packets to the one or more community ports, the primary VLAN to reject packets from the one or more isolated ports and to reject packets from the one or more community ports;

Cisco's Private VLAN DI Products have a "primary VLAN" that practices this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports" discussed above. In addition, Cisco's primary VLAN rejects packets from the one or more isolated ports and community ports as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

f. **an isolated VLAN, the isolated VLAN to receive packets from outside of the router through an isolated port of the one or more isolated ports and to transfer the packets to the one or more promiscuous ports, the isolated VLAN to prevent transfer of the packets from the isolated port to another isolated port of the one or more isolated ports, and the isolated VLAN to prevent transfer of the packets from the isolated port to the one or more community ports, and the isolated VLAN to reject packets from the one or more promiscuous ports;**

Cisco's Private VLAN DI Products have an "isolated VLAN" that practices this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 20 limitation "said isolated VLAN configured as a one way connection from all isolated ports to all promiscuous ports and also configured to prevent any other isolated port from receiving said user's packets from said isolated VLAN" discussed above. In addition, Cisco's isolated VLAN rejects packets from the one or more promiscuous ports as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

g. **and a community VLAN, the community VLAN to receive packets from outside of the router at a community port of the one or more community ports and to transfer the packets to the one or more promiscuous ports and to transfer the packets to any other community ports, the community VLAN to prevent transfer of packets to the one or more isolated ports, the community VLAN to reject packets from the one or more promiscuous ports.**

Cisco's Private VLAN DI Products have a "community VLAN" that practices this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 21 limitation "to receive said packet through a community VLAN, all other community ports connected to said community VLAN also receiving said packet, but not any other ports of said switch, said community VLAN configured as a one way connection from all community ports in said community VLAN to all promiscuous ports" discussed above. In addition, Cisco's community VLAN rejects packets from the one or more promiscuous ports as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

7. '145 Patent – Claim 45

a. A computer readable medium containing executable program instructions for operating a router, the executable program instructions comprising program instructions configured to:

The record evidence shows that the Cisco Private VLAN DI Products practice this claim limitation under all claim constructions. Cisco's Private VLAN DI Products meet the plain and ordinary meaning of "router" adopted above because all of Cisco's products are devices with routing capabilities. They also satisfy this limitation under the constructions proposed by Arista and the Staff because they are layer 3 (network layer) devices of the OSI reference model. CX-0003C (Jeffay WS) at Q/A 441-449, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-1220C (Jeffay RWS) at Q/A 17; CX-0062 at 1; CX-0078 at 50; CX-0079 at 52; CX-0071 at 17; CX-0080 at 23; CX-0068 at xlv; CX-0073 at 1-1; CX-0082 at 1-14; CX-0081 at 1-13; CX-0072 at 30-2, 30-4; *see* Duda Tr. 776.

In addition, IOS and NX-OS comprise the operating system software on Cisco's devices that control the devices and provide an interface for configuration. CX-0003C (Jeffay WS) at Q/A 442.

b. establish a first VLAN from a port connected to a shared network to a plurality of user ports, the first VLAN to receive packets from the shared network and to transfer them to one or more of the user ports, the first VLAN to reject any packets received from the user ports;

Cisco's Private VLAN DI Products have a "primary VLAN" that practices this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports" discussed above. In addition, Cisco's primary VLAN rejects any packets received from the user ports as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

c. establish a second VLAN from the plurality of user ports, the second VLAN to receive packets from the user ports and to transfer them to the port connected to the shared network, the second VLAN to prevent transfer of packets from one of the user ports to other user ports, and the second VLAN also to reject packets from the shared network, to thereby separate packet traffic of different users.

Cisco's Private VLAN DI Products have an "isolated VLAN" that practices this claim limitation under all proposed constructions for the same reasons given for the '592 patent claim 6 limitation "said selected isolated port exchanging packets with said promiscuous port through a path inside said switch, and said isolated port not exchanging packets with another isolated port" discussed above. In addition, Cisco's isolated VLAN rejects packets from the shared network as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

8. '145 Patent – Claim 46

a. A computer readable medium containing executable program instructions for operating a router, the executable program instructions comprising program instructions configured to:

The record evidence shows that the Cisco Private VLAN DI Products practice this claim limitation under all claim constructions. Cisco's Private VLAN DI Products meet the plain and ordinary meaning of "router" adopted above because all of Cisco's products are devices with routing capabilities. They also satisfy this limitation under the constructions proposed by Arista and the Staff because they are layer 3 (network layer) devices of the OSI reference model. CX-0003C (Jeffay WS) at Q/A 441-449, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-1220C (Jeffay RWS) at Q/A 17; CX-0062 at 1; CX-0078 at 50; CX-0079 at 52; CX-0071 at 17;

CX-0080 at 23; CX-0068 at xlv; CX-0073 at 1-1; CX-0082 at 1-14; CX-0081 at 1-13; CX-0072 at 30-2, 30-4; *see* Duda Tr. 776.

In addition, IOS and NX-OS comprise the operating system software on Cisco's devices that control the devices and provide an interface for configuration. CX-0003C (Jeffay WS) at Q/A 442.

b. establish a primary VLAN, the primary VLAN to receive packets from outside of the router through the one or more promiscuous ports and to transfer the packets to one or more community ports, the primary VLAN to reject packets received from the one or more community ports;

The evidence demonstrates that the "community ports" and "primary VLAN" of Cisco's Private VLAN DI Products practice this claim limitation under all claim constructions for the reasons set forth above with respect to the '592 patent claim 7 limitation "a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network" and the '592 patent claim 20 limitation "said all promiscuous ports also connected via a one way primary VLAN to said all isolated ports," respectively. In addition, Cisco's primary VLAN rejects packets received from the one or more community ports as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

c. and establish a community VLAN, the community VLAN to receive packets from outside the router on a community port of the one or more community ports and to transfer the packets to the one or more promiscuous ports and to transfer the packets to any other community ports of the one or more community ports, the community VLAN rejecting packets received from the one or more promiscuous ports.

The evidence demonstrates that the "community ports" and "community VLAN" of Cisco's Private VLAN DI Products practice this claim limitation under all claim constructions for the reasons set forth above with respect to the '592 patent claim 6 limitation "a promiscuous port for receiving incoming packets from an external network, and for transmitting outgoing packets to said external network," the '592 patent claim 7 limitation "a plurality of community ports, each of said community ports of said plurality of community ports receiving packets from a selected external network and transmitting packets onto said selected external network," and the '592 patent claim 7 limitation "each port of said community of ports exchanging packets through a path internal to said switch with said promiscuous port, and said each port of said community of ports exchanging packets with all ports of said plurality of community ports through a path within said switch, and said each port of said community of ports not exchanging packets with any other port of said switch through a path within said switch."

In addition, Cisco's community VLAN rejects packets received from the one or more promiscuous ports as shown, for example, by Dr. Jeffay's test results. CX-0003C (Jeffay WS) at Q/A 483-489.

9. Arista's Domestic Industry Arguments

Arista raises several arguments in support of its position that the Cisco products do not practice the claims of the '592 and '145 patents. These arguments are addressed below.

a. Arista's Argument That Virtual LANs Do Not Process Packets

Similar to its argument with respect to non-infringement, Arista argues that VLANs cannot process, receive, transmit, transfer and reject packets, as required by the claims. RX-3910C (Moisand RWS) at Q/A 151, Q/A 155, Q/A 160, Q/A 193 and Q/A 198; *see* Resp. Br. at 335-37. Arista's argument is rejected for the reasons discussed above with respect to Arista's non-infringement defenses. *See* CX-0003C (Jeffay WS) at Q/A 365.

The record evidence adduced at the hearing belies Arista's assertions. Specifically, the Catalyst 3750 Configuration Guide in which Arista relied on to implement Private VLANs describes the primary, isolated, and community VLANs as "carrying" traffic. CX-0497 at 16-3; *see* CX-0068 at 15-3; Arneja Tr. 1112-1113. Arista's expert also testified that Cisco's products implement the claimed private VLAN functionality in hardware and software. RX-3901C (Moisand RWS) Q/A 176, Q/A 179, Q/A 182, Q/A 185. Therefore, Arista's argument must fail.

b. Arista's Argument That Cisco's VLANs Are Not One-Way Connections

Arista also argues that Cisco's Private VLAN DI Products do not practice the asserted claims because there is no one-way connection between ports, inasmuch as the path within the networking chips is the same regardless of the direction the packets are sent. RX-3910C (Moisand RWS) at Q/A 200-215. This argument fails for the reasons discussed above with respect to Arista's non-infringement defenses. *See* CX-0003C (Jeffay WS) at Q/A 176-184, Q/A 366, Q/A 454-493, Q/A 498-499, Q/A 503-504, Q/A 513-516. Indeed, the adduced evidence shows that Cisco's Private VLANs are understood to be one-way connections. *See, e.g.*, CX-0071 at 60 (describing an "isolated VLAN [as] a secondary VLAN that carries unidirectional traffic"); *see* CX-0068 at 15-3; CX-0069 at 21; CX-0072 at 24-3; CX-0073 at 20-3; CX-0078 at 25; CX-0079 at 27; CX-0080 at 44; CX-0081 at 44-4; CX-0082 at 16-3.

c. Arista's Argument That Cisco's Isolated Ports Do Not Prevent the Exchange of Packets

Arista argues that Cisco's Private VLAN DI Products do not practice the claimed invention because its isolated ports can exchange packets through layer 3 forwarding. RX-3910C (Moisand RWS) at Q/A217-220; *see* Resp. Br. at 377-78. For the same reasons discussed above with respect to Arista's non-infringement arguments, Arista's argument fails in the context of the technical prong analysis. *See* CX-0003C (Jeffay WS) at Q/A 367.

d. Arista's Argument That Cisco Merely Relies on a Naming Convention

Arista argues that Cisco relies on a naming convention, using terms such as "promiscuous," "isolated," and "community" in order to establish the technical prong of the domestic industry requirement. RX-3910C (Moisand RWS) at Q/A 152-154; *see* Resp. Br. at 338. This argument fails because Cisco has adduced evidence show that its products do, in fact, practice the claims of the '592 and '145 patents. *See* CX-0003C (Jeffay WS) at Q/A 443-449, Q/A 498-499, Q/A 503-504, Q/A 513-516.

e. Arista's Argument That Cisco Has Not Analyzed Customer Implementation of Private VLANs

Arista also argues that Cisco has failed to show that its Private VLAN DI Products have been used by Cisco's customers to implement private VLANs. *See* Resp. Br. at 334-35. This argument misstates the requirements for proving satisfaction of the technical prong of the domestic industry requirement. In particular, establishing the technical prong does not require a showing of actual customer use. Instead, the standard is "articles protected by the patent," which can be shown through pre-sale activities such as investments in R&D and manufacturing equipment. 19 U.S.C § 1337(a)(2). Thus, all that is necessary is that "the patent claims cover the articles of manufacture that establish the domestic industry." *Crocs, Inc. v. Int'l Trade Comm'n*, 598 F.3d 1294, 1307 (Fed. Cir. 2010); *see also Certain Wireless Communication Devices, Portable Music, and Data Processing Devices, Computers and Components Thereof*, Inv. No. 337-TA-745, Initial Determination at 67-68, 72-74 (Apr. 24, 2012) (rejecting respondent's argument that evidence of actual use of DI product was required).

In any event, the record evidence does establish that customers implement Private VLANs on Cisco products. *See* Jeffay Tr. 501. For instance, [

]. CX-0034C at Background; CX-0490 ([

]); CX-0595 ([

]). Arista's internal document ([ ]) also shows [

]. CPX-0206C at 1. Additional documents demonstrate that [

]. CX-0959C at 3; CX-0962C at 6.

E. Validity

1. Anticipation – The 802.1Q Standard

Arista contends that the IEEE 802.1Q-1998 standard anticipates all asserted claims of the Private VLAN Patents. RX-3136C (Moisand WS) at Q/A 192, Q/A 263; *see* Resp. Br. at 339-50. In particular, Arista's technical expert Mr. Moisand opines that Figures B-1, B-2, and B-4, that appear in Annex B of the 802.1Q standard, in combination with the general VLAN functionality provided by the 802.1Q standard, disclose the claimed ports and VLANs. *Id.* at Q/A 120-320. This combination, however, does not anticipate the asserted claims of the Private VLAN Patents.

The record evidence shows that the 802.1Q standard does not disclose Private VLAN functionality. Specifically, the evidence shows that the 802.1Q standard describes conventional VLANs and does not address the specific problems solved by the Private VLAN Patents, *i.e.*, isolation of users on the same LAN. The 802.1Q standard also does not describe a mechanism that can be used to implement the functionality claimed in the '592 and '145 patents. *See* CX-1220C (Jeffay RWS) at Q/A 57. None of the figures, diagrams, or other disclosures in the 802.1Q standard teaches the claim limitations of the Private VLAN Patents. As discussed in more detail below, the 802.1Q standard does not disclose a "promiscuous port," "isolated port," "community port," "primary VLAN," "isolated VLAN" or "community VLAN." CX-1220C (Jeffay RWS) Q/A 57.

a. The IEEE 802.1Q-1998 Standard Does Not Disclose "Isolated Ports" and "Isolated VLANs"

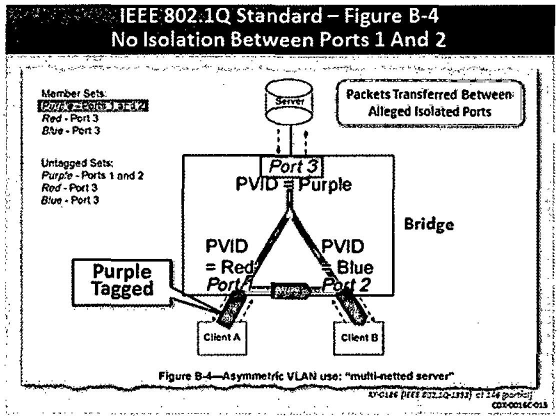
Arista contends that ports 1 and 2 in Figure B-4 are examples of the claimed "isolated ports," with the "Red" VLAN created between ports 1 and 3, and the "Blue" VLAN created between ports 2 and 3. *See* Moisand Tr. 1206; RX-3136C (Moisand WS) at Q/A 223, Q/A 225. Figure B-4 does not disclose "isolated ports," however, because products that comply with the 802.1Q standard, such as the "Bridge" in Figure B-4,[39] must allow direct communication at layer 2 between ports within the same VLAN. In particular, because both ports 1 and 2 are listed under the "Member Set" associated with the "Purple" VLAN in Figure B-4, a packet tagged with the "Purple" VLAN that enters the bridge at port 1 is able to reach all ports that are members of the "Purple" VLAN, which includes port 2. This is illustrated below, and Dr. Jeffay testified at the hearing:

> Q Now we've had some testimony today from yourself and Mr. Moisand yesterday about tagged and untagged packets. Can you explain

[39] As experts for both Cisco and Arista testified, the "Bridge" in Figure B-4 is an 802.1Q-compliant bridge. Moisand Tr. 1213; Jeffay Tr. 1375. As such, that the ports on such a bridge must have particular functionalities specified by the 802.1Q standard. CX-1220C (Jeffay RWS) at Q/A 91-92.

to the Court what would happen if a purple tagged packet came into port 1 on figure B-4 that was addressed to port 2?

A Sure. So remember, the VLANs here are colored. So the purple VLAN has as its member sets the ports that packets can be delivered to as being port 1 and port 2. So if a packet comes in on port 1 with carrying a VLAN tag of purple addressed to a device that's connected to port 2, that packet will be delivered from port 1 to port 2.


IEEE 802.1Q Standard – Figure B-4
No Isolation Between Ports 1 And 2
Member Sets:
Red - Port 3
Blue - Port 3
Untagged Sets:
Purple - Ports 1 and 2
Red - Port 3
Blue - Port 3
Server
Packets Transferred Between Alleged Isolated Ports
Port 3
PVID = Purple
Bridge
PVID = Red
Port 1
PVID = Blue
Port 2
Purple Tagged
Client A
Client B
Figure B-4—Asymmetric VLAN use: "multi-netted server"

Jeffay Tr. 1373-1374; CDX-0016C-015; *see* CX-1220C (Jeffay RWS) at Q/A 90.

The lack of isolation between ports 1 and 2 stems from the "Acceptable Frame Types" parameter of the 802.1Q standard. In particular, Section 8.4.3 of the 802.1Q standard sets forth two parameters defining how all 802.1Q-compliant devices must handle packets entering at a port, which are (a) Admit Only VLAN-tagged frames or (b) Admit All Frames. RX-0186 at 31; Jeffay Tr. 1374-1375. As such, under either parameter, 802.1Q-compliant devices must be configured to accept tagged packets and cannot be configured to block tagged packets.[40] Jeffay Tr. 1375; CX-1220C (Jeffay RWS) at Q/A 92-93. Therefore, a "purple"-tagged packet must be

[40] As Dr. Jeffay testified, blocking tagged packets on an 802.1Q-compliant bridge was introduced only in the 2005 version of the IEEE 802.1Q standard, which is not prior art to the Private VLAN patents. CX-1220C (Jeffay RWS) at Q/A 93.

accepted between ports 1 and 2 in Figure B-4, which means there is no isolation between these ports and thus no scenario in the 802.1Q standard in which the claimed "isolated ports" can be configured:

> Q Is there any way to configure the bridge in figure B-4 of the 802.1Q standard to be compliant with the standard and yet not accept tagged packets?
>
> A No, it's not possible.
>
> Q So in view of that, in your opinion, is there any way to configure the bridge of figure B-4 to have isolated ports?
>
> A No, there's no way.

Jeffay Tr. 1375.

Mr. Moisand also testified regarding an additional, hypothetical third client port, port 4, having the same "VID association and member set . . . used for port 1," that he suggested shows isolation between ports 1 and 4. RX-3136C (Moisand WS) at Q/A 212, Q/A 223. Inasmuch as Mr. Moisand relies on a modification to Figure B-4, Arista's anticipation argument is defeated. Moreover, even the addition of a hypothetical port 4 to Figure B-4 would not result in isolated ports for the reasons discussed above. CX-1220C (Jeffay RWS) at Q/A 96. Specifically, inasmuch as ports 1 and 4 will be part of the same "Member Set" and part of the Purple VLAN, they can exchange packets directly with each other, *i.e.*, there is no port isolation. *Id.*

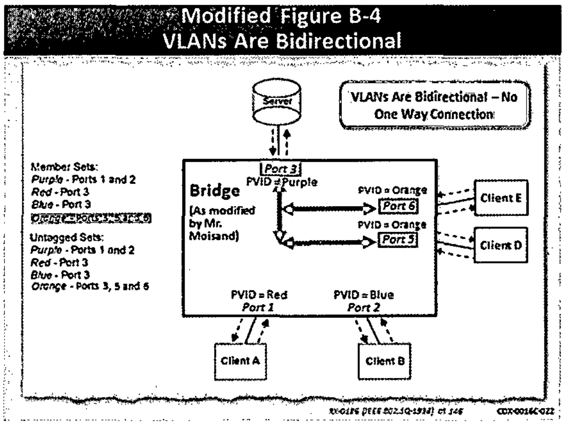
Arista further contends that Figures B-1 and B-2 of the 802.1Q standard show examples in which "direct traffic between ports 1 and 2 is not possible at Layer 2." RX-3136C (Moisand WS) at Q/A 207, Q/A 208. Although this argument does not expressly state that either Figure B-1 or B-2 discloses any of the claimed elements of the Private VLAN Patents, it is implied that, inasmuch as ports 1 and 2 cannot communicate with each other at layer 2, they are examples of "isolated ports" with the corresponding VLANs being examples of "isolated VLANs." *Id.*

Yet, neither Figure B-1 nor B-2 discloses "isolated ports" because, in both diagrams, ports 1 and 2 are ports in conventional VLANs which, as discussed above, must be capable of accepting packets that can be transmitted to all ports in their respective VLAN. RX-0186 at 31; Jeffay Tr. 1374-1375; CX-1220C (Jeffay RWS) at Q/A 75, Q/A 80, Q/A 92-93. Moreover, under all parties' constructions, an "isolated VLAN" has to be a one way connection from isolated ports to the promiscuous port or ports. Each VLAN in Figure B-1 and B-2, however, is a conventional VLAN that must be capable of transmitting packets to all ports in the VLAN, in all directions. CX-1220C (Jeffay RWS) at Q/A 75, Q/A 82. Thus, the VLANs shown in Figures B-1 and B-2 are bi-directional and not a "one way" connection as required by the claims. *Id.*; *see* CDX-0016C-012.

b. The IEEE 802.1Q-1998 Standard Does Not Disclose "Community Ports" and "Community VLANs"

Arista argues that the 802.1Q standard discloses community ports and community VLANs. *See* RX-3136C (Moisand WS) at Q/A 229-235. However, this argument is not supported by specific disclosures within the 802.1Q standard, but instead relies on configurations that are "built into the standard." *See* RX-3136C (Moisand WS) at Q/A 230. More specifically, in order to demonstrate community ports and community VLANs, Arista's expert Mr. Moisand modified Figure B-4 by adding two new ports, ports 5 and 6, which, along with port 3, would establish a new VLAN that includes all ports associated with it (*i.e.*, ports 3, 5 and 6) as the Member Set. RX-3136C (Moisand WS) at Q/A 212, Q/A 223, Q/A 231. According to Mr. Moisand, when Figure B-4 is modified in this manner, ports 3, 5, and 6 would be considered "community ports" and the VLAN connecting them a "community VLAN." *Id.* at Q/A 229-235.

This reliance on hypothetical modifications of Figure B-4 to disclose community ports and VLANs punctures Arista's anticipation argument. Moreover, the proposed modification of Figure B-4 does not disclose a "community VLAN," inasmuch as the new hypothetical VLAN is not a "one way" connection required by all proposed constructions, but a bi-directional VLAN as illustrated below:


Modified Figure B-4
VLANs Are Bidirectional
Server
VLANs Are Bidirectional – No One Way Connection
Member Sets:
Purple - Ports 1 and 2
Red - Port 3
Blue - Port 3
Orange - Ports 3, 5 and 6
Untagged Sets:
Purple - Ports 1 and 2
Red - Port 3
Blue - Port 3
Orange - Ports 3, 5 and 6
Bridge
(As modified by Mr. Moisand)
Port 3
PVID = Purple
PVID = Orange
Port 6
PVID = Orange
Port 5
Client E
Client D
PVID = Red
Port 1
PVID = Blue
Port 2
Client A
Client B
CDX-0016C-022

CDX-0016C-022; CX-1220C (Jeffay RWS) at Q/A103.

In addition, the hypothetical modifications to Figure B-4 proposed by Mr. Moisand do not disclose "community ports" because Figure B-4 does not disclose isolated or promiscuous ports, and thus necessarily does not disclose community ports under any construction of the term.[41] CX-1220C (Jeffay RWS) at Q/A 101.

Arista also argues that Figure B-1 "expressly disclose[s]" the member set including all ports associated with the VLAN, thereby "resulting in community ports." *See* RX-3136C (Moisand WS) at Q/A 230, Q/A 207. The evidence shows, however, that no such disclosure exists in Figure B-1 or any other part of the 802.1Q standard. CX-1220C (Jeffay RWS) at Q/A

[41] Mr. Moisand's implicit suggestion of modifying Figure B-4 so that Ports 1, 2, and 3 are all part of the same member set fails for the same reasons as adding ports 5 and 6. *See* CX-3136C (Moisand WS) at Q/A 230.

57, Q/A 67, Q/A 72. Instead, Figure B-1 shows conventional VLANs without any isolation between ports within a VLAN. CX-1220C (Jeffay RWS) at Q/A 72. Moreover, Figure B-1 does not disclose a "community VLAN" because under all parties' constructions, the VLANs disclosed are bi-directional, and not "one way" connection as required. CX-1220C (Jeffay RWS) at Q/A 74.

c. The IEEE 802.1Q-1998 Standard Does Not Disclose "Promiscuous Ports" and "Primary VLANs"

Arista further argues that port 3 in Figure B-4 of the 802.1Q standard is an example of the claimed "promiscuous port," and that the corresponding "Purple" VLAN created between ports 1, 2, and 3 is an example of the claimed "primary VLAN." *See* RX-3136C (Moisand WS) at Q/A 216, Q/A 218. No other promiscuous ports or primary VLANs are identified by Arista. This analysis is faulty because Arista fails to identify any isolated or community ports that the promiscuous port is connected to, as is required by all constructions. CX-1220C (Jeffay RWS) at Q/A 86. In addition, Figure B-4 does not disclose a "primary VLAN" because, under all parties' constructions, a "primary VLAN" is a VLAN that connects to promiscuous, isolated, and community ports, and does not permit packets to be transferred to it from an isolated or community port. As discussed above, however, the 802.1Q-compliant bridge in Figure B-4 must permit ports 1 and 2 in Figure B-4 to exchange packets directly with each other using the "Purple" VLAN, which precludes that VLAN from being a primary VLAN. Jeffay Tr. 1373-1376; CX-1220C (Jeffay RWS) at Q/A 88.

2. Obviousness

Arista proposes three combinations of alleged prior art references that it contends render obvious the asserted claims of the Private VLAN patents. *See* RX-3136C (Moisand WS) at Q/A

338-346. Arista, however, fails to provide any explanation of how the references would be combined together or why a person of ordinary skill in the art would be so motivated. Moreover, as Dr. Jeffay testified, the references are either from non-analogous fields or are not directed to the problem of achieving isolation between users within a VLAN. Further, the combination of these references together does not render obvious the inventions of the Private VLAN patents, because they do not disclose the claimed elements. *See* CX-1220C (Jeffay RWS) at Q/A 60, Q/A 220-225.

a. The 802.1Q Standard in Combination With U.S. Patent No. 5,752,003

Arista argues that "[a] combination of the isolated ports within a VLAN disclosed in the '003 patent and the asymmetric VLAN configuration disclosed in 802.1Q, renders obvious" the asserted claims. *See* RX-3136C (Moisand WS) at Q/A 340. As Dr. Jeffay testified, however, the '003 patent does not disclose isolated ports and isolated VLANs but, to the contrary, explicitly describes that all ports in the same VNET are in the same broadcast domain and are able to communicate with each other without any isolation. CX-1220C (Jeffay RWS) at Q/A 222; RX-3158 ('003 patent) at col. 6, lns. 46-51. Likewise, the '003 patent fails to disclose any of the other claimed ports or VLANs. CX-1220C (Jeffay RWS) at Q/A 58, Q/A 60, Q/A 149, Q/A 150-181. Therefore, the combination of 802.1Q standard and the '003 patent would not render obvious the asserted claims. *Id.* at Q/A 222.

In addition, a person skilled in the art would not be motivated to combine these references together, inasmuch as the '003 patent is directed to ATM technology. This technology was not considered a viable solution for LAN and VLAN applications in the 2000 time-period due to its high costs, complexity, and fundamental differences from the packet-switching technology described in the Private VLAN Patents. CX-1220C (Jeffay RWS) at Q/A 221.

b. The 802.1Q Standard in Combination with the Haviland Publication

Arista argues that asserted claims are obvious over 802.1Q in view of the White Paper titled "Designing High-Performance Campus Intranets with Multilayer Switching" by Cisco's Geoff Haviland in 1998 ("Haviland"). *See* RX-3136C (Moisand WS) at Q/A 331-38, Q/A 341-43. Haviland is directed to the design of campus intranets using multilayer switching. *See* RX-3136C (Moisand WS) at Q333-335; RX-3156 (Haviland) at 4-6, Figs. 2-3. Haviland teaches that Ethernet-attached hosts and servers associated with one VLAN can communicate with hosts and servers associated with that VLAN, but cannot directly communicate with hosts and servers associated with a different VLAN. *See* RX-3136C (Moisand WS) at Q/A 336-337. It is argued that "a combination of Haviland's port communities associated with a VLAN and the asymmetric VLAN configuration disclosed in 802.1Q, renders obvious" the asserted claims. *See id.* at Q/A 343.

As Dr. Jeffay testified, however, the Haviland publication describes the use of conventional VLANs and does not disclose isolation between ports within a LAN. CX-1220C (Jeffay RWS) at Q/A 224. In addition, the Haviland publication does not disclose any other claimed ports or VLANs. CX-1220C (Jeffay RWS) at Q/A 59, Q/A 60, Q/A 187-219. Therefore, the combination of 802.1Q standard and the Haviland Publication would not render obvious the asserted claims of the '592 patent. CX-1220C (Jeffay RWS) at Q/A 224.

In addition, a person skilled in the art would not be motivated to combine these references together, inasmuch as the Haviland Publication deals with ATM technology which, as discussed above, was not considered a successful solution as LAN technology. CX-1220C (Jeffay RWS) at Q/A 223. Moreover, the Haviland publication discloses conventional networking technology using conventional VLANs, and therefore there would be no reason for a person skilled in the art to consult the Haviland publication in addition to the 802.1Q standard itself. *Id.*

c. The 802.1Q Standard in Combination With U.S. Patent No. 5,752,003 and the Haviland Publication

Arista contends that the combination of 802.1Q standard with the '003 patent and the Haviland Publication renders obvious the asserted claims. For the reasons discussed above with respect to the first two combinations, the record evidence establishes that the combination of all three references together would not render the asserted claims obvious, and a person skilled in the art would not be motivated to combine these references together. *See* CX-1220C (Jeffay RWS) at Q/A 225. In particular, the combination of all three references would not teach isolated ports, isolated VLANs, or isolation between ports that are within the same VLAN, as required by the '592 and '145 patents. *See id.* at Q/A 221-224.

d. Secondary Considerations of Non-Obviousness

Even if the combinations identified by Arista did disclose each and every element of the claimed inventions of the Private VLAN Patents, secondary considerations of non-obviousness support the finding that the claimed inventions would not have been obvious to a person of ordinary skill in the art. Specifically, Cisco adduced evidence showing that the inventions set forth in the Private VLAN Patents have proven commercially successful, addressed long felt but unresolved needs, succeeded where others have failed, and have been praised by others. CX-0003C (Jeffay WS) at Q/A 519-522; CX-0027 at 12; CX-0028 at 1; CX-0095C at 31-3. In addition, the record evidence shows that [

], thereby showing a long-felt need for the Private VLAN technology and the failure of Arista to satisfy this demand without the patented Private VLAN technology. CX-0003C (Jeffay WS) at Q/A 523-525, Q/A 410-412; CX-0959C at 3; CX-0056C at 1; *see* CPX-0201C at 1; CPX-0202C at 1; CPX-0200C at 1; CPX-0203C at 1; CPX-0204C at 1; CPX-0205C at 1; CPX-0206C at 1; CPX-0207C at 1; CPX-0208C at 1; CPX-0209C at 1.

3. Patentable Subject Matter

Arista argues that the asserted claims of the '592 and '145 patents are invalid as drawn to unpatentable subject matter. Specifically, it is argued that the claims are "directed to the abstract idea of VLANs, particularly exchanging or handling packets by use of VLANs." *See* RX-3136C (Moisand WS) at Q/A 350, Q/A 361. As with Arista's related arguments with respect to non-infringement and technical prong discussed above, the arguments here are equally flawed.

The Private VLAN Patents are not directed to an abstract idea, but rather to a specific device, namely a switch or a router, configured in a specific way to have new types of ports and new types of VLANs in order to isolate users' traffic. CX-1220C (Jeffay RWS) at Q/A 227. The claims all recite a switch or router comprising a VLAN, which is a definite structure. CX-1220C (Jeffay RWS) at Q/A 228. Indeed, even Arista's expert Mr. Moisand testified that the asserted claims of the Private VLAN Patents refer to physical devices such as a switch or router having ports. Moisand Tr. 1200-1201. These physical devices and structures are the opposite of "an idea, having no particular concrete or tangible form." *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014).

Far from being the types of claims that present issues under Section 101, the Private VLAN Patents do not claim an algorithm or computerize an approach that was implemented manually in the prior art, but rather claim a new, specific and useful device to solve a problem that existed in the networking field in the prior art. *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014) ("The claims stand apart because they do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks."). Indeed, when determining whether a claim is directed to an abstract idea or a patent-eligible invention, the analysis is based on the claims "as a whole," rather than "dissect[ing] the claims" and ignoring those limitations that make the claims concrete. *Diamond v. Diehr*, 450 U.S. 175, 188 (1981); *see also Digitech Image Techs., LLC v. Elecs for Imaging Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014) (holding that "determining whether a claim recites an abstract idea" requires "examin[ing] the claims as a whole").

Further, in addition to claiming definite structures rather than an abstract concept, the Private VLAN Patents also cover an inventive concept. As the Supreme Court reaffirmed in *Alice*, "solv[ing] a technological problem in 'conventional industry practice,'" "improv[ing] an existing technological process," "improv[ing] the functioning of the computer itself," or "effect[ing] an improvement in any other technology or technical field" is sufficient to 'transform' a claimed abstract idea into a patent-eligible invention. *Alice*, 134 S. Ct. at 2358-59 (quoting *Diamond v. Diehr*, 450 U.S. 175, 178 (1981)). Here, the Private VLAN Patents solved the problem in the prior art of separating users' traffic on a LAN. The patents claim a mechanism for isolating user traffic on a computer network that is implemented by networking devices with specific configurations of new types of VLANs and new types of ports, one that can be implemented and stored in assignment tables, memory, switching chips, and other hardware of software components. CX-1220C (Jeffay RWS) at Q/A 233-238. All the asserted claims, therefore, require special purpose devices, and not routine or conventional structures, such as switches and routers with specific defined structures that implement the new types of ports and new types of VLANs, and which transform the networking device into a special purpose machine that can enforce the private VLAN mechanism. CX-1220C (Jeffay RWS) at Q/A 238.

4. Arguments Relating to 35 U.S.C. § 112

Arista raises several arguments that the asserted claims of the '592 and '145 patents are invalid for failure to comport with the requirements of 35 U.S.C. § 112. As discussed below, Arista has failed to show that the asserted claims are invalid.

a. Indefiniteness – Circularity

Arista argues that all asserted claims of the Private VLAN Patents are "circular and indefinite." Specifically, it is argued that inasmuch as certain claim elements (such as the "primary," "isolated," and "community" VLANs) are defined by their relationship to other claim elements, they are "circular" and thus indefinite. *See* RX-3136C (Moisand WS) at Q/A 402-405. However, the fact that one claim element is defined in terms of its relationship to other claim elements does not make the claims circular, and it does not render them indefinite. A person skilled in the art would understand the meaning of the claim elements at issue, as well the claim elements' relationship with other elements. CX-1220C (Jeffay RWS) at Q/A 250-251. Accordingly, because "a person of ordinary skill in the art, with the aid of the specification, would understand what is claimed, the claim is not indefinite." *Biosig Instruments*, 783 F.3d 1374 at 1381.

It is further argued that the claims at issue are indefinite because "Cisco does not distinguish [] by which VLANs the ports connect to" and, using Figure 3 as an example, because "it is arbitrary which port can be labeled the community port and which port can be labeled the promiscuous port." *See* RX-3136C (Moisand WS) at Q/A 405. This argument does not succeed. Although each of the ports in Figure 3 can be configured to be either a promiscuous or community port, a person having ordinary skill in the art would not mistaking the functionality of the ports, which can be ascertained by looking at their configuration. *See* CX-1220C (Jeffay RWS) at Q/A 252. Therefore, looking at Figure 3, a person having ordinary skill in the art would understand that only ports 320-324 could be promiscuous ports, inasmuch as these are the only ports configured for exchanging packets with isolated and community ports by use of VLANS. *Id.*

b. Mixed Apparatus and Method Steps

Arista argues that claims 6 and 7 of the '592 patent and claims 5 and 46 of the '145 patent are indefinite for reciting both an apparatus and a method of using that apparatus. *See* RX-3910C (Moisand WS) at Q/A407. Arista's argument is rejected for two reasons. First, Arista's position does not comport with case law in this area, and second, because it is permitted for patent claims to describe apparatus or system claims by their functions or capabilities.

Arista's reliance on *IPXL Holdings L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377 (Fed. Cir. 2005) and its progeny to support its argument is inapposite because the facts in this investigation are distinguishable from the facts in those cases. In particular, those cases based their decisions on claim elements explicitly calling for user action, a factual scenario not present here. For example, in *IPXL*, the challenged claim read:

> The system of claim 2 [including an input means] wherein the predicted transaction information comprises both a transaction type and transaction parameters associated with that transaction type, and the user uses the input means to either change the predicted transaction information or accept the displayed transaction type and transaction parameters.

IPXL, 430 F.3d at 1383-84 (quoting U.S. Patent No. 6,149,055) (alteration in original).

None of the Private VLAN claims that Arista challenges include reliance on user action.

Rembrandt Data Techs., LP v. AOL, LLC, 641 F.3d 1331, 1339-40 (Fed. Cir. 2011) is also cited in support of Arista's invalidity argument. Nevertheless, the claim element at issue in *Rembrandt* is different from the claim elements at issue here. In *Rembrandt*, the element at issue was a pure method step, disconnected from any structure at all, and unlike the claim elements here that specifically claim structures (*i.e.*, an isolated port) with particular capabilities. *Id.* at 1339. In contrast, the other elements of the claim at issue in *Rembrandt*, which were found by the Federal Circuit to properly recite apparatus elements, use active language to describe the capabilities of the claimed structures, a usage present in the claims at issue here. *Id.*

Moreover, it is settled law that apparatus or system claims may properly claim recited components by describing their function or capabilities, and that the use of such functional language does not render them indefinite. *See Halliburton Energy Servs. v. M–I LLC*, 514 F.3d 1244, 1255 (Fed. Cir. 2008); *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008); *K–2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1363 (Fed. Cir. 1999). Each of the disputed claim terms at issue here recites an apparatus with particular capabilities which, in part, distinguish the claimed ports and VLANs from other types of ports and VLANs. For example, claims 6 and 7 each specifically claim a device, *i.e.*, a "switch," including various structures, such as ports, which have particular capabilities as set forth in the claims, and which do not require that a user actually perform any method step. CX-1220C (Jeffay RWS) at Q/A 254-256. As Dr. Jeffay testified regarding claim 7 of the '145 patent:

Q What does it mean to you to have a VLAN in a router?

> A It means the router has been programmed to create that VLAN, to forward -- it's been programmed so that it will forward packets according to the rules that are configured for that VLAN. It contains the VLAN, if you will.

Jeffay Tr. 522.

The same analysis applies to claims 5 and 46 of the '145 patent. CX-1220C (Jeffay RWS) at Q257. Thus, a person of ordinary skill in the art would understand that these claims do not require that the device or a user actually perform any method steps. CX-1220C (Jeffay RWS) at Q/A 253-257. The challenged claims are therefore not invalid for claiming mixed method and apparatus claims.

c. Indefiniteness – Failure to Specify a Time Period

Arista argues that claims 6 and 7 of the '592 patent are invalid as indefinite for failing to inform with reasonable certainty whether the claims cover "not exchanging packets" at all points in time, or only at limited point in time. *See* RX-3910C (Moisand WS) at Q/A409. This argument is without merit, because, as Dr. Jeffay testified, a person skilled in the art would understand that the "not exchanging" requirements of claims 6 and 7 of the '592 patent refer to the capability of isolated and community ports. A time period does not need to be specified in the claim language because that capability is a requirement for a port to be an isolated or community port. CX-1220C (Jeffay RWS) at Q/A 258. Accordingly, a person skilled in the art would understand the scope of the claimed invention with respect to that aspect of those ports with reasonable certainty. *Biosig*, 783 F.3d at 1381.

d. Written Description – "Router"

Arista argues that the claims of the '145 patent lack sufficient written description because the specification fails to describe implementation of the invention on a router. *See* RX-3136C (Moisand WS) at Q/A 378-391. This argument cannot succeed, inasmuch as the specification of the Private VLAN Patents contains various disclosures of practicing the claimed invention in routers. For example, the specification of the '145 patent describes that the claimed VLANs can be programmed in a router: "[P]rimary VLANs and secondary VLANs (that is Isolated or Community VLANs) are programmed in the router using Color Blocking Logic (CBL)." JX-0006 ('145 patent) at col. 7, lns. 25-27. The specification also describes that the data associated with private VLAN configuration can be stored in a router:

> Data shown in table 500 may be held, in a particular implementation, in a variety of places. For example some data is in the header of a received packet, some data may be held in hardware such as memory in an ASIC chip in the interface, or further, some of the data may be held in a software lookup table in the memory for a processor of the router. As a further example, an implementation may use a table such as Table 500 in main memory for a processor of the router.

JX-0006 ('145 patent) at col. 6, lns. 6-14; *see* JX-0006 ('145 patent) at col. 2, lns. 7-13; col. 7, lns. 25-27; col. 6, lns. 8-14; col. 6, lns. 53-57.

e. Written Description – "First VLAN"

Arista argues that the term "first VLAN" appearing in asserted claims 5 and 45 of the '145 patent is indefinite for failure to satisfy the written description requirement. *See* RX-3136C (Moisand WS) at Q/A 392-396. Arista's expert Mr. Moisand, however, testified that a person skilled in the art would have known that a "first VLAN" can mean, in at least one embodiment, a primary VLAN, as indicated by Arista's proposed construction for the term, and a primary VLAN is described in detail in the specification. RX-3136C (Moisand WS) at Q/A 393, Q/A 395; *see* CX-1220C (Jeffay RWS) at Q/A 244. Mr. Moisand testimony shows that Arista's written description argument cannot succeed, as there can be no written description problem with respect to the term "first VLAN" where it is shown that the claimed "first VLAN" is embodied by the primary VLAN in the specification.[42]

Moreover, as Dr. Jeffay testified, the claims that recite a "first VLAN" expressly describe the characteristics and functionality of the "first VLAN" in a way that would allow a person skilled in the art to understand the scope of the claimed invention. CX-1220C (Jeffay RWS) at Q/A 244. For example, claim 5 of the '145 patent states that the first VLAN is "from the port connected to the shared network to the plurality of user ports," with the first VLAN being configured "to receive packets from the shared network and transferring them to a designated user port," and also that the first VLAN is configured "to reject packets from the user ports." JX-0006 ('145 patent) at col. 10, ln. 62 – col. 11, ln. 10. This description of the first VLAN is sufficient to inform a person skilled in the art about the characteristics of the first VLAN and the scope of the claimed invention. CX-1220C (Jeffay RWS) at Q/A 244-245 (discussing source code and testing); JX-0006 ('145 patent) at col. 10, ln. 62 – col. 11, ln. 10.

f. Written Description – "Second VLAN"

Arista argues that the term "second VLAN" appearing in asserted claims 5 and 45 of the '145 patent is indefinite for failure to satisfy the written description requirement. *See* RX-3136C (Moisand WS) at Q/A 397-401. For example, Arista's expert Mr. Moisand testified:

> Under Cisco and the Staff's construction, the Second VLAN need not be the isolated or community VLAN, which I find no support for in the specification. Therefore, if Cisco and the Staff's construction is adopted, claims reciting a "Second VLAN" are invalid. . . . As with "First VLAN," the term "Second VLAN" does not appear in the specification. The specification instead describes the purported invention in relation to three

[42] Although the "first VLAN" is not limited to that embodiment for purposes of claim construction, it is sufficiently described by that embodiment. *See* CX-1220C (Jeffay RWS) at Q/A 244.

> purportedly new types of VLANs, a primary VLAN, an isolated VLAN, and/or a community VLAN.

RX-3136C (Moisand WS) at Q/A 398, Q/A 401.

Mr. Moisand further testified:

> As I discussed in reference to claim construction, however, read in light of the specification the term "Second VLAN" requires either the "Isolated" or "Community" VLAN, one of the three recited VLAN types disclosed in the specification. To the extent that Second VLAN does not require an "Isolated" or "Community" VLAN, the specification does not show that the inventors were in possession of such a claim and in fact Inventor Foschiano directly testified that he was not in possession of such a claim.

RX-3136C (Moisand WS) at Q/A 401.

Yet, Mr. Moisand also testified that a person skilled in the art would have known that a "second VLAN" can mean, in at least some embodiments, an isolated VLAN or a community VLAN, as indicated by Arista's proposed construction for the term, and isolated and community VLANs are described in detail in the specification. RX-3136C (Moisand WS) at Q/A 398, 400; *see* CX-1220C (Jeffay RWS) at Q/A 247. Mr. Moisand testimony shows that Arista's written description argument cannot succeed, as there can be no written description problem respect to the term "second VLAN" where it has been shown that the claimed "second VLAN" is practiced by at least two different embodiments in the specification. JX-0006 ('145 patent) at col. 4, lns. 51-64; col. 5, lns. 9-19; col. 5, lns. 52-57.[43]

Moreover, as Dr. Jeffay testified, the claims that recite a "second VLAN" expressly describe the characteristics and functionality of the "second VLAN" in a way that would allow a person skilled in the art to understand the scope of the claimed invention. CX-1220C (Jeffay

[43] Although the "second VLAN" is not limited to these embodiments for purposes of claim construction, it is sufficiently described by these embodiments. CX-1220C (Jeffay RWS) at Q/A 247.

RWS) at Q/A 247. Claim 5 of the '145 patent, for example, explicitly states that the second VLAN is "from the plurality of user ports," that the second VLAN is configured "to receive packets from the user ports and transferring them to the port connected to the shared network," and also that the second VLAN is configured "to prevent transfer of packets from one of the user ports to other user ports, and . . . to reject packets from the shared network, in order to separate packet traffic of different users." JX-0006 ('145 patent) at col. 10, ln. 62 – col. 11, ln. 10. This description of the second VLAN is sufficient to inform a person skilled in the art about the characteristics of the second VLAN and the scope of the claimed invention, and nothing in the description of the VLAN limits the implementation of "second VLAN" to only isolated or community VLANs. CX-1220C (Jeffay RWS) at Q/A 247-248; JX-0006 ('145 patent) at col. 10, ln. 62 – col. 11, ln. 10.

VIII. The '164 (Zero Touch Provisioning) Patent

A. Claim Construction

1. Level of Ordinary Skill

Arista argues that a person of ordinary skill in the field of art of the '164 patent would be a person with a Bachelor's Degree in Computer Science, Computer Engineering, Electrical Engineering, or a closely related field, along with 2-3 years of industry experience in computer networks and systems. Additional education in a relevant field, such as Computer Science, Computer Engineering, Electrical Engineering, or industry experience may compensate for a deficit in one of the other aspects of the requirements. *See* RX-2836C (Nettles WS) at Q/A 107-110.

The Staff takes the position that a person of ordinary skill would be a person with a bachelor's degree in computer science, computer engineering, electrical engineering, or a closely related field, along with at least 2-3 years of experience working in the field of network devices or computer networks. *See* Staff Br. at 67-68. Cisco is willing to accept the Staff's proposal as a compromise position between those proposed by Cisco and Arista. *See* Cisco Br. at 307; *see also* CX-1218C (Bhattacharjee RWS) at Q/A 30 (opining on the qualifications of a person having ordinary skill in the art).

Based on the testimony provided by experts for Cisco and Arista, it is determined that a person having ordinary skill in the art with respect to the '164 patent would be a person with a bachelor's degree in computer science, computer engineering, electrical engineering, or a closely related field, along with at least 2-3 years of experience working in the field of network devices or computer networks.

2. Disputed Claim Terms

a. "in response to faults of a network device" / "faults of a network device" (claims 1 and 18)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
Preamble is not limiting; if it is found to be limiting, no construction necessary.	"in response to an abnormal condition of the network device"	Preamble is limiting, however, no construction is necessary. The Staff had originally taken the position that the preamble is not limiting. If the preamble is limiting, no construction necessary.

The claim terms "in response to faults of a network device" and "faults of a network devices" are recited in the preambles of asserted claims 1 and 18. It is determined that these terms in the preamble are limiting, inasmuch as the recited "network device" in the preamble provides the antecedent basis for the term "device" in the body of the claims. It is further determined that no construction is necessary for these claim terms because the plain meaning of the terms is evident from reading the intrinsic evidence. *See* CX-0008C (Bhattacharjee WS) at Q/A 115-120. In particular, the patent specification describes faults and the recovery from faults in the context of a loss of connectivity. *Id.*; JX-0003 ('164 patent) at col. 6, lns. 19-25.

b. "configuration" (claims 1, 5, 6, 9, and 18)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "state of the various services, functions, parameters and interface devices with which the device may be equipped"	"a text format file containing configuration states"	No construction necessary. If construction is necessary, "the various services, functions, parameters and interface devices with which the device may be equipped"

The claim term "configuration" is recited in every asserted claim of the '164 patent. As proposed by Cisco, the term is construed to mean "state of the various services, functions, parameters and interface devices with which the device may be equipped." This construction comports with the understanding of a person having ordinary skill in the art and is consistent with the teachings of the patent specification. Moreover, the adopted construction is substantially similar to that proposed by the Staff. *See* Staff Br. at 69.

The record evidence establishes that "configuration" is a commonly used term in the art, and that one of ordinary skill in the art would understand that configuring a device parameter constitutes putting a device in one of multiple possible states that the parameter can assume. *See* CX-0008C (Bhattacharjee WS) at Q/A 123. This understanding of the term "configuration" is supported by the teachings of the patent specification:

> Network devices such as routers and switches and the like maintain a configuration state using a text format file also known as a "configuration file," or just "configuration" as used herein. The configuration reflects the various services, functions, parameters and interface devices with which the device may be equipped.

JX-0003 at col. 3, lns. 6-12; CX-0008C (Bhattacharjee WS) at Q/A130.

By contrast, Arista's proposed construction limits a "configuration" to "a text format file containing configuration states," a limitation excludes embodiments disclosed in the patent specification. Indeed, the specification teaches that a text format file is only one of multiple disclosed embodiments, which also include non-text files such as "machine-only readable" files:

> In various embodiments, the recovery configuration may be an XML formatted file, or a file formatted in either a human or a machine-only readable format, or may be encrypted using an encryption technique or the like. In one embodiment, however, the recovery configuration is a text file.

JX-0003 ('164 patent) at col. 8, lns. 1-6; *see* CX-0008C (Bhattacharjee WS) at Q/A 128-129. Arista does not explain why its construction improperly excludes disclosed embodiments or how it adds clarity to the claim language where it attempts to construe the term "configuration" using that same term in the definition.

Accordingly, the claim term "configuration" is construed to mean "state of the various services, functions, parameters and interface devices with which the device may be equipped."

c. "configuration instructions" (claims 1 and 18)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "requests to make a change or modification to the current configuration"	"requests to make a change or modification to the current configuration"	No construction necessary. If construction is necessary, "requests to make a change or modification to the current configuration"

The claim term "configuration instructions" is recited in asserted claims 1 and 18. As proposed by all parties, this term is construed to mean "requests to make a change or modification to the current configuration." *See* Compl. Br. at 313-14; Resp. Br. at 238-39; Staff Br. at 68-69. This construction reflects the plain meaning of the term and is supported by the specification. *See* RX-2836C (Nettles WS) at Q/A 86; JX-0003 ('164 Patent) at col. 6, lns. 32-37 ("Configuration instructions may include directions to change the current configuration of the device.").

d. "detecting a loss of connectivity between the device and a network resulting from the configuration change" (claims 1 and 18)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction necessary, "identifying that the configuration change resulted in a loss of connectivity between the device and a network"	"identifying that the configuration change caused connectivity between the device and a network to be lost"	No construction necessary. If construction is necessary, "identifying that the configuration change resulted in connectivity between the device and a network to be lost"

The claim term "detecting a loss of connectivity between the device and a network resulting from the configuration change" is recited in asserted claims 1 and 18. As proposed by Cisco, this term is construed to mean "identifying that the configuration change resulted in a loss of connectivity between the device and a network," a construction that reflects the plain meaning of the words. The adopted construction also reflects the claim language, which requires that "a loss of connectivity" "result[s] from the configuration change."

By contrast, Arista's proposed construction is inconsistent with the intrinsic evidence. In particular, the claim language provides that a loss of connectivity "result[s]" from the configuration change. The specification also uses the word "result," and not "caused," in relation to the loss of connectivity and configuration change. *See*, *e.g.*, JX-0003 ('164 patent) at col. 3, lns. 19-24; col. 5, lns. 53-65. The specification does, however, use the word "cause" in other unrelated contexts. *See*, *e.g.*, JX-0003 ('164 patent) at col. 10, lns. 47-50 ("Execution of the sequences of instructions contained in main memory 406 causes processor 404 to perform the process steps described herein.").

Accordingly, the claim term "detecting a loss of connectivity between the device and a network resulting from the configuration change" is defined to mean "identifying that the configuration change resulted in a loss of connectivity between the device and a network."

e. "in association with manufacturing the device" (claims 1 and 18)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
No construction necessary. If construction is necessary, "in connection with the manufacture of the device"	"at the time of manufacture of the device"	"at the time of manufacture of the device"

The claim term "in associate with manufacturing the device" is recited in asserted claims 1 and 18. As proposed by Cisco, the term is construed to mean "in connection with the manufacture of the device," a construction that is consistent with the patent specification. The specification teaches: The disputed phrase appears in claims 1 and 18. As the specification explains, "[t]he CPEs are shipped with a generic bootstrap or minimal configuration that is copied from or generated at the vendor based on a standard template or format specified by the service provider." JX-0003 ('164 patent) at col. 1, lns. 32-38. The patent later refers to the same bootstrap configuration, which is used as a recovery configuration, as being loaded during manufacture. JX-0003 ('164 patent) at col. 5, lns. 48-53 ("According to one embodiment, a generic or 'boot' configuration is 110A loaded as the current configuration of CPE A 110 during manufacture."); *see id.* at col. 3, lns. 59-60. The intrinsic evidence, therefore, describes the recovery configuration as being shipped with the device.

f. "network level configuration" (claim 5)

Complainant Cisco's Proposed Construction	Respondent Arista's Proposed Construction	Staff's Proposed Construction
"a complete and current configuration information"	"configuration enabling the device to connect to other devices in the network"	"complete and current configuration information"

The claim term "network level configuration" is recited in asserted claim 5. As proposed by Cisco and the Staff, the term is construed to mean "a complete and current configuration," a meaning that comports with the teachings of the patent itself. Specifically, the specification teaches:

> Accordingly, a recovery configuration for CPE A 110 need only provide sufficient information for the CPE A 110 to establish the connection with the configuration manager 152 in order to obtain complete and current configuration information (herein referred to as a network level configuration) in order to then connect with other devices, such as aggregator 150, for example using the network 103.

JX-0003 ('164 patent) at col. 5, lns. 37-43.

B. Literal Infringement Analysis

For the reasons set forth below, the accused Arista devices do not infringe the asserted '164 claims because they fail to satisfy one or more of the limitations of the asserted claims.[44]

[44] Inasmuch as the accused products do not literally infringe the '164 patent, there can be no finding that Arista is liable for indirect infringement of the '164 patent.

1. The Accused Products Are Not Fault Recovery Processes – All Asserted Claims

The evidence establishes that the accused ZTP functionality is an initial provisioning process, and not a fault recovery mechanism as claimed in the '164 patent. *See, e.g.*, RX-2896C (Arista, Quick Start Guide, Data Center Switches Models) at ANI-ITC-944_945-0850985; RX-3912C (Duda RWS) at Q/A 104, Q/A 106; RX-3915C (Sadana RWS) at Q/A 37. The '164 patent is directed to recovering from a fault, *i.e.*, a loss of connectivity, resulting from a configuration change. Bhattacharjee Tr. 530-531. If someone changes the configuration and interrupts connectivity, the claimed invention will restore connectivity by reverting to a factory-installed recovery configuration. *See* JX-0003 ('164 patent) at claim 1.

Evidence adduced at the hearing shows that ZTP and its role differ from the fault recovery scenario described in the '164 patent. Cisco's infringement argument rests upon a manufactured situation in which the startup-config file is removed from a working, connected device and that device is then power cycled. *See, e.g.*, Compl. Br. at 317-22. It is alleged that restarting a device with its startup-config removed is a catastrophic fault as described in the '164 patent. Bhattacharjee Tr. 552.

Yet, Arista's CTO and corporate designee on ZTP functionality, Dr. Duda, testified that the lack of a startup-config file is not a fault:

> Q Before this case, have you ever heard anybody talking about deleting a startup-config file, placing the switch in a fault condition?
>
> A No. In fact, we instruct our customers to delete the startup-config file and reboot the switch in order to re-enter ZTP mode. Why would we tell our users to create catastrophic faults. There's nothing faulty about deleting your startup-config. It's just a crazy notion.

Duda Tr. 874-875.

The lack of a startup-config filed does not qualify as fault under any of the party's proposed constructions. The evidence shows that a device understands whether an event or state is unexpected or abnormal only to the extent that it is designed to identify those differences. RX-3911C (Nettles RWS) at Q/A 63-64.

Arista's products are designed to presuppose the lack of a configuration on initial boot up to allow for client-specific provisioning. *See, e.g.*, RX-3912C (Duda RWS) at Q/A 110; RX-2896C ([ ]) at ANI-ITC-944_945-0850972. [ ]. *See, e.g.*, RX-3912C (Duda RWS) at Q/A 110, Q/A 107; RX-2896C ([ ]) at ANI-ITC-944_945-0850985 ("[ ]."). The devices can operate "[ ]" even if the startup-config file is deleted or even if the device never received a startup-config in the first place. RX-3912C (Duda RWS) at Q/A 117, Q/A 124; JX-0031 (Pech Dep. Tr.) at 37. Further, a user can cancel the ZTP process and boot the switch without using a startup-config file. RX-3911C (Nettles RWS) at Q/A 51; RX-2894C ([ ]) at CSI-ANI-00128400.00335.

Cisco's expert Dr. Bhattacharjee has testified that an Arista device without a startup-config is abnormal. CX-0008C (Bhattacharjee WS) at Q/A 154-155, Q/A 158, Q/A 161-162. This analysis selectively quotes several documents based on the assumption that any alternative to "normal" operations constitutes abnormal behavior and is therefore a fault. *See id.* at Q/A 159-60. For example, Dr. Bhattacharjee relies on a flow chart created at least eight months before the first public release of ZTP to argue that booting an Arista device without a startup-config is a fault. CX-0008C (Bhattacharjee WS) at Q/A 159-60; CX-0177C (Arista

Software Status, 2010-09-14) at 1, 14. Yet, the chart differentiates the soon-to-be introduced process from all the processes that existed before it, and does not show that operating an Arista device without a startup-config is a fault. RX-3911C (Nettles WS) at Q/A 61; *see id.* at Q/A 64.

Accordingly, it is determined that the accused products are not fault recovery processes as required by all asserted claims of the '164 patent.

2. The Accused Products Do Not Detect a Loss of Connectivity – All Claims

The record evidence shows that the accused Arista switches do not infringe any of the asserted claims of the '164 patent under any party's proposed claim construction because [ ]. RX-3911C (Nettles RWS) at Q/A 89. Cisco's infringement allegations with respect to this claim limitation depend on the proposition that a person of ordinary skill would consider checking for the presence of a locally-stored startup-config file during switch boot-up to be "detecting the loss of connectivity between the device and a network." *See id.* at Q/A 90; Compl. Br. at 326-31. The evidence adduced at the hearing, however, contradicts Cisco's argument.

For example, Cisco's expert Dr. Bhattacharjee testified that removing an existing startup-config file does not by itself cause a loss of connectivity. *See* Bhattacharjee Tr. 551. In addition, the evidence shows that [ ]. RX-3911C (Nettles RWS) at Q/A 91; RX-3912C (Duda RWS) at Q/A 119, Q/A 123.

[ ]. *See, e.g.*, RX-3912C (Duda RWS) at Q/A 116; RX-3911C (Nettles RWS) at Q/A 92-93; RX-2894C

([ ]) at CSI-ANI-00128400.0000052. Indeed, a the presence of a startup-config file filled with nonsensical or otherwise invalid text will not trigger ZTP. *See* RX-3912C (Duda RWS) at Q/A 112. Moreover, [

] because it verifies only the file's existence and not its contents. RX-3911C (Nettles RWS) at Q/A 94; RX-3912C (Duda RWS) at Q/A 112. At no point in this situation does the system determine connectivity or its ability to communicate with other devices on the network. RX-3911C (Nettles RWS) at Q/A 93.

Accordingly, it is determined that the accused products do not satisfy the "detecting a loss of connectivity resulting from the configuration change" limitation of all asserted '164 claims.

3. The Accused Products Performing Initial Provisioning Do Not Infringe – All Asserted Claims

The evidence shows that initial provisioning of a switch from the factory without a startup-config loaded does not practice the asserted claims. When adding the device to the network for the first time, the ZTP process will trigger without ever receiving configuration instructions or changing the current configuration to a new configuration based on the non-existent configuration instructions. *See* RX-3911C (Nettles RWS) at Q/A 54-55; RX-2896C ([ ]) at ANI-ITC-944_945-0850985; RX-3912C (Duda RWS) at Q/A 107.

Indeed, Cisco has stated that it does not accuse the initial provision functionality of the Arista switches of infringing the '164 patent. *See, e.g.*, Compl. Br. at 329 ("[T]he Accused

Products do detect a loss of connectivity during initial provisioning—just not one resulting from a configuration change, as required by the claims.").

C. Technical Prong of the Domestic Industry Requirement

For the reasons set forth below, the '164 DI Products do not practice the asserted '164 claims because they fail to satisfy one or more of the limitations of the claims.

Evidence adduced at the hearing establishes that Cisco's PoAP is a provisioning feature designed to provide a minimal startup configuration when a Cisco switch, especially a brand-new switch, is booted without a startup configuration file. RX-3911C (Nettles RWS) at Q/A 167. This minimal startup configuration enables the switch to contact a DHCP server, through which the switch can locate a source for a software image and a startup-config file. *Id.*

Once triggered, the PoAP software dynamically writes instructions to a temporary startup configuration file. RX-3911C (Nettles RWS) at Q/A 168. PoAP then begins DHCP discovery. *Id.* The DHCP response instructs the device to where it may obtain the rest of its configuration. *Id.* The device then downloads the configuration and/or software image from the network server. *Id.* Afterwards, the device reboots with the new configuration. *Id.*

1. The Domestic Industry Products Do Not Detect a Loss of Connectivity – All Claims

The record evidence shows that the '164 DI Products do not practice any asserted claim of the '164 patent under any party's proposed claim construction because PoAP detects the lack of a file, and not the claimed loss of connectivity between the device and the network. *See* RX-3911C (Nettles RWS) at Q/A 192. Cisco's technical prong argument with respect to this claim limitation is similar to its infringement argument inasmuch as it argues that checking for the presence of a startup-config file stored locally on the device practices the limitation of "detecting the loss of connectivity between the device and the network." *See id.* at Q/A 193; Compl. Br. at 343-45.

Evidence adduced that the hearing establishes, however, that deleting the startup-config file does not cause a loss of connectivity, and that the system does not attempt to detect a loss of connectivity when the startup-config is deleted. RX-3911C (Nettles RWS) at Q/A 194. Additionally, when booting up, the domestic industry products detect only whether the startup-config exists. *Id.* At no point does the system make a determination regarding connectivity or its ability to communicate with other devices on the network. *Id.* In addition, Cisco's expert Dr. Bhattacharjee provided testimony stating that the system is capable of sending and receiving packets during the boot process when a startup-config file is not present, thereby establishing that the device does not lack connectivity. CX-0008C (Bhattacharjee WS) at Q/A 435; *see id.* at Q/A 197.

Accordingly, it is determined that the '164 DI Products do not practice the "detecting a loss of connectivity resulting from the configuration change" limitation of the asserted '164 claims.

2. The Domestic Industry Products Are Not Fault Recovery Processes – All Claims

The record evidence establishes that PoAP does not revert to a recovery configuration in response to the faults of a network device under the claim constructions proposed by any party. *See* RX-3911C (Nettles RWS) at Q/A 172. Specifically, it has been shown that the lack of a startup-config file within the PoAP process is not a fault as required by the asserted claims. *See id.*

Evidence adduced at the hearing demonstrates that PoAP is a provisioning process designed for new devices, direct from the manufacturer, that do not have a startup-configuration file and that must be provisioned and configured for installation in a new network. RX-3911C (Nettles RWS) at Q/A 173; *see, e.g.*, RX-2904C (Cisco Nexus 5000 Series NX-OS Configuration Guide) at CSI-ANI-00124733.000046; RX-2906C (Power On Auto Provisioning slideshow) at CSI-ANI-00188500. The lack of a startup-configuration is an expected step in the PoAP process and does not constitute an abnormal condition or a fault as claimed in the '164 patent. *See* RX-3911C (Nettles RWS) at Q/A 173-175.

D. Validity

Arista has not met its burden to show by clear and convincing evidence that any of the asserted claims of the '164 patent is invalid. In support of its invalidity arguments, Arista relies primarily on four references: U.S. Patent No. 7,069,334 to Wysoczynski (RX-2840), Cisco's AutoInstall product, and Cisco's AutoConfig product. None of these references teaches the invention of the '164 patent or otherwise renders the claims of that patent invalid.

1. Anticipation – U.S. Patent No. 7,069,334 to Wysoczynski

Wysoczynski relates generally to modifying the known concept of a "debug" mode, which "gives the user the opportunity to check the configuration state or memory/register contents to find out what caused the problem." RX-2840 (Wysoczynski) at col. 1, lns. 36-39; *see* CX-1218C (Bhattacharjee RWS) at Q/A 68-70. It discloses a new user command for use on a network device in debug mode, which is used for rolling back a network device to a last known configuration. *See* RX-2840 (Wysoczynski) at col. 4, lns. 45-51. Wysoczynski teaches that a debug mode is distinct from reverting a device to a factory default. In particular, Wysoczynski characterizes the process of factory reset as "needless and undesirable." RX-2840

(Wysoczynski) at col. 1, lns. 49-52. Wysoczynski's debug mode comprises a command prompt that asks the user to either enter in the location of the image and configuration it wishes to download, or else to accept downloading the prior image and configuration based on the location of the last known good image. RX-2840 (Wysoczynski) at col. 4, lns. 42-51; col. 5, lns. 13-15.

a. Claim 1

The evidence shows that Wysoczynski does not disclose several elements of claim 1 of the '164 patent under all of the parties' proposed constructions.

In particular, Wysoczynski fails to disclose the limitation of "recovering from a loss of connectivity by reverting to a recovery configuration." CX-1218C (Bhattacharjee RWS) at Q/A 72. As discussed above, Wysoczynski discloses a debug mode. RX-2840 (Wysoczynski) at col. 1, lns. 36-39. Applying the claim constructions adopted above, this debug mode is not a "configuration" that provides the state of the various services, functions, parameters and interface devices with which the device may be equipped. Applying Arista's proposed construction, the debug mode is not a text file containing configuration states. Therefore, Wysoczynski does not satisfy the claim limitations requiring that the device "revert to a recovery configuration" by "retrieving a recovery configuration" and "making it the current configuration." *See* CX-1218C (Bhattacharjee RWS) at Q/A 72.

Wysoczynski also does not disclose the claimed "recovery configuration" that "is stored in a persistent storage of the device in association with manufacturing the device." CX-1218C (Bhattacharjee RWS) at Q/A 74. Rather, Wysoczynski teaches that the "devices 210 and 230 also have information stored on them about the last known good image and configuration values that were approved by the administrator or user." RX-2840 (Wysoczynski) at col. 5, lns. 13-16. These parameters are the "names of the last known good image and configuration file," which are only known after manufacture once the device has been installed with a first set of known good image and configuration files. *See* RX-2840 (Wysoczynski) at col. 4, lns. 45–51. Accordingly, there can be no disclosure of "retrieving" factory default parameters from persistent memory and establishing connectivity to a configuration manager using those retrieved parameters.

Wysoczynski also fails to meet the limitation of "recovering from the loss of connectivity by reverting to a recovery configuration" because it requires user intervention in order to initiate a rollback file transfer with a remote file server. CX-1218C (Bhattacharjee RWS) at Q/A 75; RX-2840 (Wysoczynski) at col. 4, lns. 56-68. Specifically, Wysoczynski requires there to be a user entering a command at the console. *See* RX-2840 (Wysoczynski) at col. 4, lns. 56-68. By contrast, the '164 patent makes clear that the claimed "recovering from the loss of connectivity by reverting to a recovery configuration," *i.e.*, establishing connectivity to a configuration manager using the recovery configuration, is done without user intervention. JX-0003 ('164 patent) at col. 6, lns. 48-50 (describing "an automated recovery process"); col. 5, lns. 29-33; col. 6, lns. 24-28 (teaching recovery "substantially independent of human intervention"); col. 8, lns. 63-67; col. 8, lns. 48-51. Indeed, the stated purpose of the claimed invention is to avoid the need for user intervention in recovering a device. JX-0003 ('164 patent) at col. 1, lns. 27-31; col. 1, lns. 48-54. One of ordinary skill, reading the claims in light of the specification, would understand that "establishing connectivity to a configuration manager using the recovery configuration" is without user intervention. *See* CX-1218C (Bhattacharjee RWS) at Q/A 77. Accordingly Wysoczynski does not practice this limitation.

Accordingly, it is determined that Wysoczynski does not anticipate claim 1 of the '164 patent.

b. Claim 5

The evidence adduced at the hearing shows that Wysoczynski fails to disclose several elements of claim 5 of the '164 patent under all of the parties' proposed claim constructions. CX-1218C (Bhattacharjee RWS) at Q/A 83-88. As an initial matter, inasmuch as claim 5 depends from claim 1, claim 5 is not invalidated by Wysoczynski for the same reasons that it does not invalidate claim 1. *See* CX-1218C (Bhattacharjee RWS) at Q/A 84.

In addition, Wysoczynski does not disclose the "network level configuration" limitation recited in claim 5. CX-1218C (Bhattacharjee RWS) at Q/A 84. Wysoczynski discloses receiving a "last known good image and configuration file from a TFTP server." RX-2840 (Wysoczynski) at col. 4, lns. 46-55. The '164 patent distinguishes the claimed invention from rolling back to a previous configuration, and indicates that doing the latter is undesirable because it may lead to unreliable network connectivity. JX-0003 ('164 patent) at col. 1, ln. 55 – col. 2, ln. 5. Therefore, under claim constructions adopted above, the last known good image and configuration file is not the claimed "complete and current configuration information," and it is not a configuration enabling the device to connect to other devices in the network as required by Arista's proposed claim constructions.

c. Claim 9

The record evidence shows that Wysoczynski fails to disclose several elements of claim 9 of the '164 patent under all of the parties' proposed constructions. *See* CX-1218C (Bhattacharjee RWS) at Q/A 93-94. As an initial matter, inasmuch as claim 9 depends on claim 1, Wysoczynski does not anticipate claim 9 for the same reasons it does not anticipate claim 1. Moreover, Wysoczynski does not disclose a "configuration" under any of the proposed constructions, as previously discussed with respect to claim 5.

d. Claim 18

The steps recited in the body of claim 18, which is directed to a "computer-readable medium," are substantially similar to those recited in claim 1. JX-0003 ('164 patent) at col. 14, lns 3-23. Thus the record evidence shows that Wysoczynski does not anticipate claim 18 for the same reasons it does not anticipate claim 1. *See* CX-1218C (Bhattacharjee RWS) at Q/A 95-96.

2. Anticipation – AutoInstall

AutoInstall is a software feature intended to simplify the installation process when a new Cisco router running the IOS operating system is brought into a network. *See* RX-2891C (CSI-ANI-00217643) at CSI-ANI-00217644.

Arista has not established that AutoInstall invalidates the asserted '164 claims, not least because Arista has failed to show that AutoInstall discloses the '164 claim limitation "retrieving a recovery configuration." *See* CX-1218C (Bhattacharjee RWS) at Q/A 99, Q/A 103-108. Specifically, the AutoInstall code that Arista identifies as containing a recovery configuration is not retrieved from persistent storage in the order required by the claims. Additionally, AutoInstall does not disclose retrieving and executing CLI commands or text files that configure the device. *See id.*

3. Anticipation – AutoConfig

AutoConfig is a software feature intended to simplify the installation process when a new Cisco Catalyst 2950 switch is brought into a network. *See* RX-2854 (Catalyst 2950 Desktop Switch Software Configuration Guide – Cisco IOS Release 12.1(9)EA1); RX-2855 (Catalyst 2950 Desktop Switch Software Configuration Guide – Cisco IOS Release 12.0(5)WC(1)).

Arista has not established that AutoConfig invalidates the asserted '164 claims, not least because Arista has failed to show that AutoConfig discloses the '164 claim limitation "retrieving a recovery configuration" as part of "recovering from the loss of connectivity by reverting to a recovery configuration, wherein the recovery configuration is stored in a persistent storage of the device in association with manufacturing the device." CX-1218C (Bhattacharjee RWS) at Q/A 129. It is undisputed that AutoConfig is describing a feature of Cisco's IOS operating system. Similar to devices running AutoInstall, devices running IOS load the entire software image into memory at boot, before detecting the lack of a startup-config and in contrast with the requirements of the claim language. The record evidence fails to establish that the AutoConfig feature deviates from this practice by retrieving a recovery configuration after detecting a loss of connectivity, as required by the claim language. *See* CX-1218C (Bhattacharjee RWS) at Q/A 130; JX-0003 ('164 patent) at Fig. 2A.

4. Obviousness – Wysoczynski in Combination with Johnson

Arista argues that Wysoczynski in combination with U.S. Patent No. 7,475,389 to Johnson ("Johnson") renders obvious asserted claim 6 of the '164 patent. *See* Resp. Br. at 288-89. Yet, the record evidence fails to establish that a person of ordinary skill in the art would be motivated to combine these two references to arrive at the invention of claim 6.

Evidence adduced at the hearing demonstrates that a person of ordinary skill would not be motivated to combine Wysoczynski with Johnson because Johnson teaches resetting a device to factory default, whereas Wysoczynski teaches away from resetting a device to factory default. *See* CX-1218C (Bhattacharjee RWS) at Q/A 91; RX-2840 (Wysoczynski) at col. 1, lns. 49-57; RX-2841 (Johnson) at col. 3, lns. 55-59; col. 3, lns. 7-11; col. 5, lns. 2-48.

Moreover, Johnson fails to teach either a "recovery configuration" that is a "boot configuration," or a situation "wherein establishing connectivity to a configuration manager using the recovery configuration" comprises "establishing connectivity with the configuration manager as a new device." CX-1218C (Bhattacharjee RWS) at Q/A 91. Instead, Johnson discloses a gaming console that registers with a recovery unit when it is initially installed so that the recovery unit can keep track of what software is later installed on that gaming console. RX-2841 (Johnson) at col. 3, lns. 50-59. Registering with a remote server when the gaming console still has connectivity is not using a "recovery configuration" that is a "boot configuration" to establish "connectivity with the configuration manager as a new device" as required by claim 6. *See* CX-1218C (Bhattacharjee RWS) at Q/A 6162; JX-0003 ('164 patent) at col. 3, lns. 54-55. Thus, even if Wysoczynski were combined with Johnson, the combination would not satisfy the limitations of claim 6. CX-1218C (Bhattacharjee RWS) at Q/A 91.

Accordingly, Arista has not shown by clear and convincing evidence that Wysoczynski in combination with Johnson renders obvious claim 6 of the '164 patent.

5. Secondary Considerations of Non-Obviousness

The nonobviousness of the '164 patent is also demonstrated by evidence suggesting that claimed invention fulfilled a long-unresolved need in the industry to solve the problem of remotely reconfiguring a device that has lost connectivity resulting from a change in configuration. *See* CX-1218C (Bhattacharjee RWS) at Q/A142-144; JX-0047C (Woodman Dep. Tr.) at 49-51. Others had failed to address the problem through mechanisms such as a rollback that creates security vulnerabilities and provides no certainty of re-establishing connectivity. *See* CX-1218C (Bhattacharjee RWS) at Q/A 22; JX-0003 ('164 patent) at col. 1, ln. 55 – col. 2, ln. 5. The '164 patent teaches a recovery configuration stored in persistent storage that could be used to establish connectivity to a configuration manager without manual intervention. JX-0003 ('164 patent) at col. 2, lns. 6-9.

IX. Equitable Defenses

A. Equitable Estoppel

To establish that Cisco is equitably estopped, Arista must prove by a preponderance of the evidence that (1) Cisco, through misleading conduct, led Arista to reasonably believe that Cisco did not intend to enforce its patents against Arista; (2) Arista relied on that conduct; and (3) due to its reliance, Arista would be materially prejudiced if Cisco were permitted to proceed with its charge of infringement. *See A.C. Aukerman Co. v. R.L. Chaides Const. Co*, 960 F.2d 1020, 1028, 1042 (Fed. Cir. 1992) (*en banc*); *Multimedia Patent Trust* 2012 WL 6863471, No. 10–CV–2618–H (KSC) at *20. As discussed below, Arista has failed to meet this burden.

1. There Was No Misleading Conduct by Cisco

The evidence shows that Cisco was not aware of Arista's infringement of the patents in suit until May 21, 2014, approximately seven months before it sued Arista. *See* CX-1221C (Lang RWS) at Q/A 59; RX-0007C (Cisco's Response to Interrogatory No. 8) at 3. The fact that Cisco had not addressed Arista's infringement before that time does not constitute "intentionally misleading silence" that can give rise to a finding that equitable estoppel applies. *See Stryker Corp. v. Zimmer, Inc.*, 741 F. Supp. 509, 512-13 (D.N.J. 1990) ("While silence alone is not sufficient to give rise to estoppel, intentionally misleading silence where 'some evidence' exists to show that the silence was misleading enough to induce the alleged infringer to reasonably infer that the patentee has abandoned his patent claims will be sufficient."). Moreover, the record evidence shows that Cisco has not been "silent" as to suspected patent infringement by Arista or others. In the past, Cisco has taken affirmative steps to protect its intellectual property rights by asserting patents shortly after learning of infringing activities. *See* CX-1329 (Huawei Complaint) at CSI-ANI-00675877.

In addition, the evidence fails to establish that Cisco's public statements regarding enforcement of its intellectual property rights could lead Arista to reasonably believe that Cisco would not enforce its patents against Arista. *See, e.g.*, RX-3840 (Forbes article concerning "patent trolls" by Cisco's General Counsel, Mark Chandler); RX-3118 (Cisco White Paper regarding network standards); RX-2943 (Press Release: Google and Cisco Cross License); CX-0937 (Cisco Annual Report); RX-3078 (Cisco Annual Report). None of the public statements made by Cisco in these publications creates a reasonable inference that Cisco would not assert its patents against infringers. *See* CX-1222C (Djavaherian RWS) at Q/A 85-88. Rather, they demonstrate that Cisco would expect that those desiring to use Cisco technology would seek a patent license.

Moreover, Cisco's licensing and litigation activities with third respect to third parties do not "give rise to the necessary inference that the claim against the defendant is abandoned." *See Aukerman*, 960 F.2d at 1042. In particular, the existence of Cisco licenses establishes that Cisco does not permit other entities to use its intellectual property without a license, and it is highly unreasonable for Arista to believe that it could use Cisco's intellectual property without a license. Further, the fact that Cisco sued only Arista before the Commission without joining other respondents is not bad faith or misleading conduct. There is no evidence that other industry participants are infringing the patents. The fact that that industry participants sell products with similarly named features does not necessarily mean they infringe Cisco's patents. Awareness of product feature names does not constitute knowledge of infringement such that a patent enforcement suit would be a reasonable next step. *See* CX-1222C; RX-3136C (Moisand WS) at Q/A 75 (features that purport to be "private VLAN" do not necessarily infringe); CX-1222C (Djavaherian RWS) at Q/A 79-83, Q/A 91 Q/A 95-96; Djavaherian Tr. 1406.

Arista also argues that Cisco's promotion of RFC 5517 as an "informal standard" for private VLANs led Arista to believe that it would not be enforcing the Private VLAN patents against industry participants that implemented private VLAN technology in their products. *See, e.g.*, Resp. Br. at 7-8. Yet, the evidence fails to establish that encouraging adoption of a product in the industry creates any licensing obligation for patents related to that product. *See* CX-1222C (Djavaherian RWS) at Q/A 57-61, Q/A 73-75, Q/A 84, Q/A 89-91, Q/A 95-96. Evidence adduced at the hearing shows that RFC 5517 is not a standard and was never submitted to any standard setting organization for adoption. Specifically, each published version of RFC 5517 states that it is an informational submission and not standards-track. CX-1254–1264 (RFC 5517 Drafts); CX-0952 (RFC 5517) at CSI-ANI-00379874; CX-1251 (RFC 5517 approval announcement) at CSI-ANI-00666246; CX-1222C (Djavaherian RWS) at Q/A 53. Moreover, Cisco's intellectual property rights disclosure related to RFC 5517 states that a license would be required to practice any related patents unless (1) the technology were adopted as an IETF standard, and (2) the patents were necessary to the adoption of that standard. *See* CX-0492 (Cisco's IPR Disclosure) at CIS-ANI-00652998; CX-1222C (Djavaherian RWS) at Q/A 22, Q/A 24, Q/A 26, Q/A 62-72; CX-1221C (Lang RWS) at Q/A 21, Q/A 32-39, Q/A 43-47. Inasmuch as neither of these conditions were satisfied, Arista could not reasonably believe based on RFC 5517 that Cisco intended to refrain from enforcing its intellectual property rights.

2. There Was No Reasonable Reliance by Arista

To establish reliance, Arista must show that "the infringer . . . had a relationship or communication with the plaintiff which lulls the infringer into a sense of security" in connection with the infringer "taking some action." *Aukerman*, 960 F.2d at 1042-43. *Aukerman* also makes clear "that for equitable estoppel the alleged infringer cannot be unaware—as is possible under laches—of the patentee and/or its patent." *Id.*; *see also Winbond Electronics Corp. v. Int'l Trade Comm'n*, 262 F.3d 1363, 1374 (Fed. Cir. 2001) ("Thus, for this form of estoppel, the alleged infringer must have knowledge of the patentee and its patent and must reasonably infer that the patentee acquiesced to the allegedly infringing activity for some time."). Evidence adduced at the hearing demonstrates that Arista cannot prove reasonable reliance under the circumstances, and therefore cannot succeed in its argument that equitable estoppel should bar relief in this investigation.

As an initial matter, Arista maintains that [ ]. *See* RX-3879C (Duda WS) at Q/A 60; Duda Tr. 782-783, 870-871; Sweeney Tr. 1091. Accordingly, Arista could not have reasonably relied on any action by Cisco to support a belief that Cisco would not enforce the patents in suit.

Moreover, the record evidence establishes the following:

- [ ]. JX-0042C (Ullal Dep. Tr.) 160-161; Duda Tr. 763-765, 767-768.
- [ ]. Duda Tr. 787-788.
- [ ]. Duda Tr. 793-795; Sweeney Tr. 1089, 1091.
- [ ]. Duda Tr. 770-773, 777-7781; JX-0020C (Bechtolsheim Dep. Tr.) 326; JX-0022C (Cheriton Dep. Tr.) 115-116; JX-0042C (Ullal Dep. Tr.) 161.
- [ ]. JX-0042C (Ullal Dep. Tr.) 158-159.
- [ ]. JX-0042C (Ullal Dep. Tr.) 153, 162; Duda Tr. 789-790; Sweeney Tr. 1091; Arneja Tr. 1145-1146; JX-0020C (Bechtolsheim Dep. Tr.) 246-247, 269-270.

There was no express or implied communication or relationship between Cisco and Arista that could have led Arista into a false sense of security, and any reliance under the circumstances would be unreasonable. *See* CX-1222C (Djavaherian RWS) at Q/A 14, Q/A 25, Q/A 75-76, Q/A 78, Q/A 81-82, Q/A 88, Q/A 95.

3. There Was No Prejudice

Arista cannot show a "change of economic position" or that its expenditure of resources with respect to the accused products was causally related to actions taken by Cisco. *See Aukerman*, 960 F.2d at 1043. The prejudice claimed by Arista here is that "Arista invested significant resources to develop the accused products," and that "during this time, Arista's sales steadily increased as it gained a greater foothold into the market, which has resulted in a substantial product base deployed by network users throughout the country." *See* Resp. Br. at 405-06.

Inasmuch as the record evidence does not show that Arista would have taken different actions had it known about Cisco's patents, such as decreasing its expenditures with respect to developing the accused products, Arista has failed to show prejudice such that equitable estoppel could bar relief in this investigation. *Cf. ABB Robotics, Inc. v. GMFanuc Robotics Corp.*, 52 F.3d 1062, 1065 (Fed. Cir. 1995) (citing *Aukerman*, 960 F.2d at 1033) (finding prejudice because the patentee's delay and silence resulted in a change to the defendant's economic position).

B. Implied License, Waiver, and Patent Misuse

Arista argues that "Cisco's standard setting activities are another, independent reason to bar Cisco from enforcing the '145 and '59[2] patents in this investigation" because they allegedly constitute implied license, waiver, and patent misuse. *See* Resp. Br. at 406-07. Yet, the evidence adduced in this investigation fails to show that the equitable theories of implied license, waiver, or patent misuse should bar relief in this investigation.

1. Implied License

"The primary difference between the estoppel analysis in implied license cases and the analysis in equitable estoppel cases is that implied license looks for an affirmative grant of consent or permission to make, use, or sell: i.e., a license." *Wang Laboratories, Inc. v. Mitsubishi Electronics America, Inc.*, 103 F.3d at 1571, 1581 (Fed. Cir. 1997). In order for Arista to succeed in its implied license defense, Arista must demonstrate that Cisco engaged in language or conduct allowing Arista to properly infer that Cisco consented to the use of Cisco's patents, and that Arista acted upon that consent. *Id.* As discussed above, Arista has set forth no evidence of conduct by Cisco that could be interpreted as "an affirmative grant of consent or permission" for Arista to practice its Private VLAN patents.

2. Waiver

Arista's waiver theory is based on identical facts as its implied license theory, and it suffers from the same legal deficiencies. "[W]aiver is the "intentional relinquishment or abandonment of a known right." *United States v. Olano,* 507 U.S. 725, 733 (1993) (quoting *Johnson v. Zerbst*, 304 U.S. 458, 464 (1938)). "To support a finding of implied waiver in the standard setting organization context, the accused must show by clear and convincing evidence that '[the patentee's] conduct was so inconsistent with an intent to enforce its rights as to induce a reasonable belief that such right has been relinquished.'" *Hynix Semiconductor Inc. v. Rambus Inc.*, 645 F.3d 1336, 1348 (Fed. Cir. 2011). This can be shown by proving that the patentee breached a duty of disclosure to the standard setting organization, *Id.*

As discussed above, Cisco's conduct related to RFC 5517 was appropriate under the circumstances, and could not effect a waiver. Cisco's IPR disclosure explicitly states that a licensing obligation arose only if the technology were adopted as a standard, which never occurred. *See* CX-0952 (RFC 5517); CX-0492 (Cisco's IPR Disclosure). Arista has not adduced clear and convincing evidence showing that Cisco's conduct was "so inconsistent with an intent to enforce its rights as to induce a reasonable belief that such right has been relinquished." *See Hynix*, 645 F.3d at 1348. Any reliance Arista placed on the assumption that PVLAN technology was an industry standard subject to SSO obligations was not reasonable. *See* CX-1222C (Djavaherian RWS) at Q/A 25, Q/A 40-41, Q/A 45-47, Q/A 57, Q/A 66-69, Q/A 75-76, Q/A 81, Q/A 86, Q/A 91; CX-1221C (Lang RWS) at Q/A 43-47.

3. Patent Misuse

Arista has not established that Cisco committed patent misuse, which requires that the patentee "impermissibly broade[n] the physical or temporal scope of the patent grant and has done so in a manner that has anticompetitive effects." *See Princo Corp.*, 616 F.3d 1318, 1328 (Fed. Cir. 2010); *see also id.* at 1329 ("[T]he doctrine of patent misuse 'has largely been confined to a handful of specific practices by which the patentee seemed to be trying to 'extend' his patent grant beyond its statutory limits.'"). Arista argues that Cisco violated its obligation to offer a license to its Private VLAN Patents on fair, reasonable, and non-discriminatory terms ("FRAND") by asserting its patents against Arista without offering such a license. Resp. Br. at 409-10. The record evidence shows, however, that Cisco has no obligation to license its patent on FRAND terms, because it made no such contractual undertaking. *See* CX-1222C (Djavaherian RWS) at Q/A 14, Q/A 25, Q/A 40-41, Q/A 45-47, Q/A 57, Q/A 66-69, Q/A 73-76, Q/A 81, Q/A 86-88, Q/A 91; CX-1221C (Lang RWS) at Q/A 43-47.

C. Laches

To establish laches, Arista must prove that (1) Cisco delayed in bringing an infringement lawsuit for an "unreasonable and inexcusable" length of time from when it knew or reasonably should have known of its infringement claim against the accused infringer; and (2) the delay caused "material prejudice" to the defendant. *See Aukerman*, 960 F.2d at 1028. A delay in bringing suit for more than six years creates a presumption of laches. *Id.* at 1035-36. This presumption can be eliminated if the patentee shows that the delay was reasonable or that the defendant was not prejudiced. *Id.* at 1038. The laches clock begins running with a patentee's actual or constructive knowledge of defendant's infringement. *Id.* at 1035-36.

1. Laches As a Defense in Section 337 Investigations

Until now, laches has not been available as a defense in section 337 investigations before the Commission. *See, e.g.*, *Certain Sortation Systems, Parts Thereof, and Products Containing Same*, Inv. No. 337-TA-460, Initial Determination, at 142, n.20 (Oct. 22, 2002) (the Commission does not recognize laches as a defense under section 337); *Certain Personal Watercraft and Components Thereof*, Inv. No. 337-TA-452, Order No. 54 (Sept. 19, 2001) (precluding the affirmative defense of laches); *Certain EPROM, EEPROM, Flash Memory and Flash Microcontroller Semiconductor Devices*, Inv. No. 337-TA-395, Supplemental Views of Chairman Bragg, at 11 n.65 (July 9, 1998). Arista has not shown that disturbing that precedent is warranted under the circumstances of this investigation.[45] Nevertheless, as discussed below,

[45] Following the evidentiary hearing in this investigation, the Federal Circuit sitting *en banc* issued its opinion in *SCA Hygiene Prods. v. First Quality Baby Prods.*, No. 2013-1564, 2015 WL 5474261 (Fed. Cir. Sept. 18, 2015). The Federal Circuit held that laches may be considered in cases seeking injunctive relief, but this does not automatically transform laches into an available defense to bar any remedy that would otherwise be issued for violations of section 337. *See id.* at *16. *SCA Hygiene* limits the district courts' consideration of laches to bar injunctive relief in

Arista would not prevail in a laches defense here even if it were available as a defense in section 337 investigations.

2. Arista's Laches Defense

The record evidence establishes that Cisco did not delay in bringing suit for an "unreasonable and inexcusable" length of time. A successful laches defense would require that Cisco knew or reasonably should have known of Arista's infringement, and not only the existence of Arista's products or features. *See, e.g.*, *Aukerman,* 960 F.2d at 1034 ("The six years for laches begins with a patentee's knowledge of infringement."); *Intirtool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1297-98 (Fed. Cir. 2004) ("[T]he patentee must have actual or constructive knowledge of an act of infringement that gives rise to a legal claim before that clock begins to run . . . .").

Evidence adduced at the hearing demonstrates that Cisco did not become aware of Arista's infringement of Cisco's patents until May 21, 2014, seven months before filing suit. CX-1221C (Lang RWS) at Q/A 59; RX-0007C (Cisco's Responses to Interrogatory No. 8). This is not an unreasonable or inexcusable delay, and Arista provides no authority suggesting otherwise. Instead, Arista argues: "Beyond mere awareness of the products, Cisco knew of their technical features and their allegedly infringing nature." Resp. Br. at 392. It is argued that Cisco's knowledge of Arista product features having names similar to Cisco's patented product features constitutes constructive knowledge of infringement. *See, e.g.*, *id.* at 392-93, 414-18. The cited evidence, however, fails to show that laches should bar relief in this investigation.

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patent cases to the confines of the *eBay* analysis, and that determination is silent as to whether or not laches is an available defense in section 337 investigations.

The documents cited by Arista show that Cisco had a general market-related awareness that Arista sold devices with sysDB and an ability to detect faults. Yet, these are broad in nature, and Arista has not shown why Cisco should have known that Arista's devices with general functionality infringed Cisco's patents. General knowledge of a product does not mean that a party has a duty to investigate the functionality of the device. *See Wanlass v. Fedders*, 145 F.3d 1461, 1464-65 (Fed. Cir. 1998).

Furthermore, the requirement to prove material prejudice before a defense of laches can bar recovery is the same as that required for equitable estoppel. As discussed above, Arista has failed to establish that it was materially prejudiced by Cisco's alleged delay in asserting the patents in suit.

D. Unclean Hands

A complainant who seeks justice must come into court with clean hands or "the doors of the court will be shut." *Aptix Corp. v. Quickturn Design Sys., Inc.*, 269 F.3d 1369, 1375 (Fed. Cir. 2001) (quoting *Keystone Driller Co. v. General Excavator Co.*, 54 S.Ct. 146, 147 (1933)). To prove unclean hands, Arista must prove that Cisco "conducted [itself] as to shock the moral sensibilities of the judge." *Gaudiosi v. Mellon*, 269 F.2d 873, 882 (3d Cir.1959). As discussed above, Cisco has not committed misleading conduct, fraud, or deceit, in litigation, before the PTO, or elsewhere.

Nevertheless, Arista also argues that "Cisco has long been in possession of Arista's highly confidential documents, but has not come forward with any explanation about how it received those documents even though it admits that it should not have Arista confidential documents." *See* Resp. Br. at 419. In particular, it is argued:

[

].

Resp. Br. at 394 (footnote omitted).

Yet, the fact that Cisco was in possession of documents marked Arista Confidential does not establish that Cisco came before the Commission with unclean hands. In particular, Arista has not adduced evidence establishing that these documents were in fact confidential, or that they were obtained by Cisco in an improper manner. Indeed, Adam Sweeny, Arista's VP of Software Engineering, testified during the hearing that [

]. Sweeny Tr. 1096; *see also* Sweeny Tr. 1093-1096 (discussing markings on document). Mr. Sweeny also testified that [

]. *See* Sweeny Tr. at 1099-1100.[46]

Accordingly, it is determined that the equitable doctrine of unclean hands should not bar relief in this investigation.

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[46] Cisco also performed a demonstration at the hearing suggesting that [ ]. *See* Sweeny Tr. 1101-1104.

X. Domestic Industry – Economic Prong

For purposes of the economic prong analysis, and regardless of whether or not they are determined to have satisfied the technical prong for their respective asserted patents, the following products will be considered articles protected by the asserted patents:[47]

Asserted U.S. Patent No.	Cisco Domestic Industry Products
7,162,537	Cisco Carrier Routing System (CRS) Cisco Aggregation Services Routers (ASR): 9000 Series Cisco Routers: XR 12000 Series
7,290,164	Nexus Switches: 3000, 5000, 6000, 7000, 9000 Series
7,340,597	Catalyst Switches: 6500, 6800 Series Cisco Aggregation Services Routers (ASR): 901 Nexus Switches: 7000 Series
6,741,592	Catalyst Switches: 4500, 6500, CBS 3110-40 Series Industrial Ethernet Switches: 3000 Series Connected Grid Switches (CGS): 2520 Nexus Switches: 3000, 5000, 6000, 7000, 9000 Series

[47] On August 21, 2015, the administrative law judge granted Cisco's Unopposed Motion to Partially Terminate the Investigation As to Certain Asserted Claims, including all asserted claims of U.S. Patent No. 8,356,296 ("'296 patent"). Order No. 19: Initial Determination Terminating the Investigation As to Certain Claims (EDIS Doc. No. 563724). Cisco's expert, Dr. Stephen Wicker, analyzed the '296 patent and concluded that three Cisco products practice this patent: the Cisco Aggregation Services Routers (ASR) 1000 and 9000, and the Nexus 7000 series switch. *See* Compl. Pre-Hearing Br. at 758-771. Although Cisco does not rely on the ASR 1000 product with respect to any patent currently asserted in the investigation, the analysis of Cisco's domestic industry investments conducted by Dr. Leonard included Cisco's U.S. investments in this product. Cisco is not relying on its investments in this product to demonstrate the existence of a domestic industry. *See* Compl. Br. at 430 n.54.

Asserted U.S. Patent No.	Cisco Domestic Industry Products
7,200,145	Catalyst Switches: 4500, 6500, CBS 3110-40 Series Industrial Ethernet Switches: 3000 Series Connected Grid Switches (CGS): 2520 Nexus Switches: 3000, 5000, 6000, 7000, 9000 Series

The record evidence shows that Cisco maintains in the ordinary course of business a database called Teradata that tracks worldwide operating expenses. Sacks Tr. 645; CX-0011C (Sacks WS) at Q/A 53-55. Mr. Collin Sacks, a Cisco Operations Manager, queried this database to generate an operating expense ("OPEX") report for R&D and engineering expenses for the business units ("BUs") responsible for the DI Products from fiscal years 2012 to 2015. Sacks Tr. 645; CX-0011C (Sacks WS) at Q/A 53-55; CPX-0020C.

The data in the Teradata database demonstrates that Cisco has a domestic industry in the DI Products. Cisco's economic expert, Dr. Gregory Leonard, analyzed this data and concluded that Cisco's total worldwide engineering and R&D investments for all of the Cisco business units that are responsible for the DI Products were approximately $1.3 billion in each of fiscal years 2012, 2013, and 2014, and $1.1 billion in fiscal year 2015 through May 22, 2015. CX-0010C (Leonard WS) at Q/A 102-108; CPX-0020C.

A. Cisco's Engineering and R&D Activities

Cisco has presented evidence showing that engineering and R&D of Cisco products takes place in the United States, including for the DI Products. Edsall Tr. 431, 435, 435-436, 437, 438-439; Kathail Tr. 247-248; CX-0011C (Sacks WS) at Q/A 43-49. In particular, Cisco's engineers based in San Jose, California, have contributed significantly to the engineering and R&D of the DI Products. Edsall Tr. 436; CX–0011C (Sacks WS) at Q/A 26-29. Cisco witnesses testified that the DI Products have been and continue to be designed and developed in the United States, including such ongoing activities as product refinement, development of additional features, platform-specific and platform-independent software releases, hardware releases, and multiple forms of testing. CX-0011C (Sacks WS) at Q/A 47; CX-0004C (Edsall WS) at Q/A 37, Q/A 48-54, Q/A 86-89. Dr. Leonard also testified that Cisco's R&D activities include "refreshing" the DI Products to provide improved versions. Leonard Tr. 690.

B. Dr. Leonard's Analysis of Cisco's Domestic Industry

As set forth in more detail in the sections below, Dr. Leonard's analysis demonstrates that Cisco has made significant and substantial investments in the United States with respect to the DI Products. The OPEX data was apportioned by Dr. Leonard using established economic principles to reflect conservatively only Cisco's U.S. expenditures associated with the DI Products. Leonard Tr. 689-693; CX-0010C (Leonard WS) at Q/A 109-126. Dr. Leonard apportioned Cisco's worldwide BU investments to the DI Products using allocations based on the ratio of a BU's revenues corresponding to DI Products to the BU's total revenues for all products. Leonard Tr. 689-691; CX-0010C (Leonard WS) at Q/A 109-117. Dr. Leonard then apportioned these investments to exclude investments outside the United States using the percentage of engineers in each BU located in the United States. Leonard Tr. 692-693; CX-0010C (Leonard WS) at Q/A 118-126. Dr. Leonard's analyses show that Cisco has invested billions of dollars in connection with the DI Products in the United States.

1. Cisco's Investments in Plant and Equipment

Under section 337(a)(3)(A), a complainant may demonstrate a domestic industry by showing a significant investment in plant and equipment with respect to articles protected by the patent. A showing of significant investment in plant and equipment is itself sufficient to meet the economic domestic industry requirement. Here, Cisco has provided evidence of its significant investments in plant and equipment for the DI Products. Cisco employees who engage in engineering and R&D related to the DI Products work at facilities throughout the United States in which Cisco makes significant investments. CX-0010C (Leonard WS) at Q/A 91; CX-0105C (Cisco's Investments in Plant and Equipment). Cisco's San Jose headquarters provides space for thousands of engineering and R&D personnel working on the DI Products. CX-0010C (Leonard WS) at Q/A 61, Q/A 92. Cisco's other U.S. campuses also provide space for Cisco's engineering and R&D personnel working on the DI Products. *Id.* at Q/A 62, Q/A 91-92; CX-0004 (Edsall WS) at Q/A 90; CX-0678 (Cisco's 2014 Annual Report) at 31.

Dr. Leonard testified that the relevant Account Rollup items that capture Cisco's investments in plant and equipment for engineering and R&D activities are the following:

> Building Rent – Expenses related to the rent for buildings.
>
> Equipment Expense – Expenses related to low value equipment such as computers and software, networking equipment, and testing equipment.
>
> Other Facilities – General building expenses that are not recorded under Building Rent (or other related line items) such as general maintenance and repair, test lab upgrades and repair, security upgrades for facilities, and general building maintenance.
>
> Prototype – Expenses related to purchasing equipment and materials for prototyping.

CX-0010C (Leonard WS) at Q/A 128-133.

The relevant P/L Level 4 categories associated with these Account Rollup items include Engineering, General & Administrative ("G&A"), Marketing, and Sales, which cover activities that support engineering and R&D activities. CX-0010C (Leonard WS) at Q/A 134-136. For fiscal years 2012 through 2015, Cisco invested approximately $151.8 million in the '592 patent,

$72.6 in the ’537 patent, $151.8 million in the ’145 patent, $116.2 million in the ’164 patent, and $88.4 million in the ’597 patent. *Id.* at Q/A 147. This is broken down as follows:

Cisco’s U.S. Engineering and R&D Investments in Plant and Equipment for the Cisco Domestic Industry Products by Asserted Patent

Asserted U.S. Patent No.	Cisco Domestic Industry Products	FY 2012 ($)	FY 2013 ($)	FY 2014 ($)	FY 2015 ($)
6,741,592	Catalyst 4500 Switch Catalyst 6500 Switch Catalyst CBS 3110-40 Switch CGS 2520 Switch IE 3000 Switch Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	36,479,809	34,388,002	44,891,352	36,119,060
7,162,537	Cisco ASR 9000 Router Cisco CRS Cisco XR 12000 Router	22,187,907	18,738,698	17,051,241	14,688,504

Asserted U.S. Patent No.	Cisco Domestic Industry Products	FY 2012 ($)	FY 2013 ($)	FY 2014 ($)	FY 2015 ($)
7,200,145	Catalyst 4500 Switch Catalyst 6500 Switch Catalyst CBS 3110-40 Switch CGS 2520 Switch IE 3000 Switch Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	36,479,809	34,388,002	44,891,352	36,119,060
7,290,164	Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	22,341,209	26,188,715	37,892,246	29,847,569
7,340,597	Catalyst 6500 Switch Catalyst 6800 Switch Cisco ASR 901 Router Nexus 7000 Switch	24,650,513	27,012,347	21,588,587	15,178,971

Id. at Q/A 142-151; CX-0105C (Cisco's Investments in Plant and Equipment).

Dr. Leonard also testified that Cisco's investments in plant and equipment for the DI Products are significant because they are critical to its ability to competitively sell these products, and to the availability of quality products in the communications equipment industry. CX-0010C (Leonard WS) at Q/A 150-51. Dr. Leonard also compared Cisco's investments in plant and equipment for the DI Products inside the United States to those outside the United States. CX-0010C (Leonard WS) at Q/A 152-157. Total U.S. investments in plant and equipment across all of the DI Products were a greater percentage of worldwide investments than non-U.S. investments in every fiscal year under consideration, which were fiscal years 2012 through 2015. *Id.* Furthermore, total U.S. investments in plant and equipment for each of the DI Products, individually, were greater than the corresponding total non-U.S. investments in every fiscal year under consideration with just a few exceptions. *Id.*; CX-0105C (Cisco's Investments in Plant and Equipment). The high relative value of Cisco's U.S. investments to foreign investments demonstrates that Cisco's investments in the DI Products are significant. *See Certain Male Prophylactics*, Inv. No. 337-TA-546, Comm'n Op. at 26 (June 21, 2007); *see also Lelo v. Int'l Trade Comm'n*, 786 F.3d 879, 884 (Fed. Cir. 2015). Thus, Dr. Leonard has demonstrated that Cisco's investments in plant and equipment for the DI Products are economically significant, including at the time the complaint was filed. CX-0010C (Leonard WS) at Q/A 152-157.

2. Cisco's Investments in the Employment of Labor or Capital

Under section 337(a)(3)(B), a complainant may demonstrate a domestic industry by showing a significant investment in labor or capital with respect to articles protected by the patent. A showing of significant investment in labor or capital is itself sufficient to meet the economic domestic industry requirement. Here, Cisco has provided evidence showing significant investments in labor or capital in connection with the DI Products. Dr. Leonard testified that the relevant Account Rollup items that capture Cisco's investments in the employment of labor for engineering and R&D activities are the following:

Salary – Expenses related to salaries paid to engineers.

Overtime – Expenses related to overtime paid to engineers.

CX-0010C (Leonard WS) at Q/A 159-160.

The only relevant P/L Level 4 category associated with these Account Rollup items is Engineering. CX-0010C (Leonard WS) at Q/A 161. For fiscal years 2012 through 2015, Cisco invested approximately $349.3 million in the '592 patent, $117.4 in the '537 patent, $349.3 million in the '145 patent, $256.2 million in the '164 patent, and $158.1 million in the '597 patent. *Id.* at Q/A 169-170; CX-0107C (Cisco's Investments in the Employment of Labor). This is broken down as follows:

Cisco's U.S. Engineering and R&D Investments in the Employment of Labor for the Cisco Domestic Industry Products by Asserted Patent

Asserted U.S. Patent No.	Cisco Domestic Industry Products	FY 2012 ($)	FY 2013 ($)	FY 2014 ($)	FY 2015 ($)
6,741,592	Catalyst 4500 Switch Catalyst 6500 Switch Catalyst CBS 3110-40 Switch CGS 2520 Switch IE 3000 Switch Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	78,485,851	75,053,326	98,408,255	97,385,194
7,162,537	Cisco ASR 9000 Router Cisco CRS Cisco XR 12000 Router	31,432,564	32,622,049	31,137,259	22,231,893

Asserted U.S. Patent No.	Cisco Domestic Industry Products	FY 2012 ($)	FY 2013 ($)	FY 2014 ($)	FY 2015 ($)
7,200,145	Catalyst 4500 Switch Catalyst 6500 Switch Catalyst CBS 3110-40 Switch CGS 2520 Switch IE 3000 Switch Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	78,485,851	75,053,326	98,408,255	97,385,194
7,290,164	Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	46,844,173	51,325,146	76,394,216	81,689,064
7,340,597	Catalyst 6500 Switch Catalyst 6800 Switch Cisco ASR 901 Router Nexus 7000 Switch	46,372,150	42,155,603	42,388,163	27,266,744

CX-0010C (Leonard WS) at Q/A 158–170; CX-0107C (Cisco's Investments in the Employment of Labor).

Dr. Leonard testified that the relevant Account Rollup items that capture Cisco's investments in the employment of capital for engineering and R&D activities are the following:

Building Rent – Expenses related to the rent for buildings.

> Equipment Expense – Expenses related to low value equipment such as computers and software, networking equipment, and testing equipment.
>
> Other Facilities – General building expenses that are not recorded under Building Rent (or other related line items) such as general maintenance and repair, test lab upgrades and repair, security upgrades for facilities, and general building maintenance.
>
> Prototype – Expenses related to equipment and materials for prototyping.
>
> Software – Expenses related to software for engineering development, such as Cadence, Synopsis, Net Front, Wind River, and IBM, and software for standard company operations, such as Windows, Visio, and Apple software.
>
> Project Based Services – Expenses related to outsourced projects such as source code development.
>
> Outsourced Services – Expenses similar to Project Based Services, but additional outsourced work.
>
> Advisory Services – Expenses related to expert consulting or advice on technology.

CX-0010C (Leonard WS) Q/A 180-186.

The relevant P/L Level 4 categories associated with these Account Rollup items include Engineering, G&A, Marketing, and Sales, which cover activities that support engineering and R&D activities. CX-0010C (Leonard WS) at Q/A 187-189. For fiscal years 2012 through 2015, Cisco invested approximately $254.1 million in the ’592 patent, $113.5 in the ’537 patent, $254.1 million in the ’145 patent, $184.2 million in the ’164 patent, and $122.1 million in the ’597 patent. *Id.* at Q/A 197-198; CX-0108C (Cisco’s Investments in the Employment of Capital). This is broken down as follows:

Cisco's U.S. Engineering and R&D Investments in the Employment of Capital for the Domestic Industry Products

Asserted U.S. Patent No.	Cisco Domestic Industry Products	FY 2012 ($)	FY 2013 ($)	FY 2014 ($)	FY 2015 ($)
6,741,592	Catalyst 4500 Switch Catalyst 6500 Switch Catalyst CBS 3110-40 Switch CGS 2520 Switch IE 3000 Switch Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	57,219,966	53,927,241	75,974,108	67,052,609
7,162,537	Cisco ASR 9000 Router Cisco CRS Cisco XR 12000 Router	35,329,458	30,479,557	27,165,278	20,533,570
7,200,145	Catalyst 4500 Switch Catalyst 6500 Switch Catalyst CBS 3110-40 Switch CGS 2520 Switch IE 3000 Switch Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	57,219,966	53,927,241	75,974,108	67,052,609

Asserted U.S. Patent No.	Cisco Domestic Industry Products	FY 2012 ($)	FY 2013 ($)	FY 2014 ($)	FY 2015 ($)
7,290,164	Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	32,483,511	36,639,468	60,434,099	54,712,868
7,340,597	Catalyst 6500 Switch Catalyst 6800 Switch Cisco ASR 901 Router Nexus 7000 Switch	35,383,474	34,671,892	29,933,642	22,135,722

CX-0010C (Leonard WS) at Q/A 180-198; CX-0108C (Cisco's Investments in the Employment of Capital).

Dr. Leonard also testified that Cisco's U.S. investments in labor and capital for the DI Products are significant because they are critical to its ability to competitively sell these products, and to the availability of quality products in the communications equipment industry. CX-0010C (Leonard WS) at Q/A 172-173, Q/A 200-201. Dr. Leonard compared Cisco's investments in labor and capital for the DI Products inside the United States to those outside the United States. CX-0010C (Leonard WS) at Q/A 171-179, Q/A 199-207. Total U.S. investments in labor and capital across all DI Products were a greater percentage of worldwide investments than non-U.S. investments in every fiscal year under consideration, which were fiscal years 2012 through 2015. *Id.* Furthermore, total U.S. investments in labor and capital for each of the Cisco DI Products, individually, were greater than the corresponding total non-U.S. investments in every fiscal year under consideration with just a few exceptions. *Id.*; CX-0106C (Cisco's

Investments in Labor or Capital). As discussed previously, the high relative value of U.S. investments to foreign investments demonstrates that Cisco's investments in the Cisco DI Products are significant. Thus, Dr. Leonard has demonstrated that Cisco's U.S. investments in labor and capital are economically significant, including at the time the complaint was filed. CX-0010C (Leonard WS) at Q/A 171-79, Q/A 199-207.

3. Cisco's Investments in Engineering and R&D

Under section 337(a)(3)(C), a complainant may demonstrate a domestic industry by showing a substantial investment in the exploitation of the patent, including engineering, research and development, or licensing. Here, Cisco has provided evidence of its substantial investments in the exploitation of the patents through engineering and R&D. Cisco's U.S. investments in engineering and R&D include, for example, the following investments made in connection with the DI Products: equipment and designs for engineering and R&D activities; training of engineering personnel, including by attending trade shows, recruiting and relocation of engineers; compensation, including salaries and overtime pay; and operating expenses for engineering facilities, such as rent and maintenance and equipment costs. CX-0010C (Leonard WS) at Q/A 209-210. Dr. Leonard testified that all Account Rollup items capture Cisco's investments in engineering and R&D. *Id.*; CPX-0020C (Cisco's OPEX Data). The only relevant P/L Level 4 category associated with these Account Rollup items is Engineering. Leonard Tr. 674; CX-0010C (Leonard WS) at Q/A 211. For fiscal years 2012 through 2015, Cisco invested approximately $1 billion in the '592 patent, $410 million in the '537 patent, $1 billion in the '145 patent, $748.5 million in the '164 patent, and $469.6 million in the '597 patent. CX-0010C (Leonard WS) at Q/A 221; CX-0109C (Cisco's Investments in Engineering and R&D). This is broken down as follows:

Cisco's U.S. Engineering and R&D Investments for the Cisco Domestic Industry Products by Asserted Patent

Asserted U.S. Patent No.	Cisco Domestic Industry Products	FY 2012 ($)	FY 2013 ($)	FY 2014 ($)	FY 2015 ($)
6,741,592	Catalyst 4500 Switch Catalyst 6500 Switch Catalyst CBS 3110-40 Switch CGS 2520 Switch IE 3000 Switch Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	239,636,233	219,342,804	283,075,272	287,576,096
7,162,537	Cisco ASR 9000 Router Cisco CRS Cisco XR 12000 Router	113,088,534	110,978,470	106,456,862	79,531,272

Asserted U.S. Patent No.	Cisco Domestic Industry Products	FY 2012 ($)	FY 2013 ($)	FY 2014 ($)	FY 2015 ($)
7,200,145	Catalyst 4500 Switch Catalyst 6500 Switch Catalyst CBS 3110-40 Switch CGS 2520 Switch IE 3000 Switch Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	239,636,233	219,342,804	283,075,272	287,576,096
7,290,164	Nexus 3000 Switch Nexus 5000 Switch Nexus 6000 Switch Nexus 7000 Switch Nexus 9000 Switch	141,358,175	150,144,274	218,344,673	238,729,209
7,340,597	Catalyst 6500 Switch Catalyst 6800 Switch Cisco ASR 901 Router Nexus 7000 Switch	139,570,571	126,107,740	120,801,494	83,129,419

CX-0010C (Leonard WS) at Q/A 209-219; CX-0109C (Cisco's Investments in Engineering and R&D).

Cisco adduced evidence in support of its argument that it exploits the asserted patents through the ongoing engineering and R&D of the DI Products. Cisco's technical experts, Drs. Almeroth, Wicker, Jeffay, and Bhattacharjee, testified that the DI Products each practice at least one claim of the asserted patents.[48] CX-0001C (Wicker WS) at Q/A 262-305, Q/A 310-313; CX-0003C (Jeffay WS) at Q/A 441-493, Q/A 498-499, Q/A 503-504, Q/A 513-516; CX-0007C (Almeroth WS) at Q/A 283-393; CX-0008C (Bhattacharjee WS) at Q/A 407-472. Dr. Leonard also testified that the required nexus exists between the asserted patents and the DI Products because the patents are embodied in the DI Products, and because Cisco's engineering and R&D investments are directed in part to improving the patented features within the DI Products. Leonard Tr. 694; CX-0010C (Leonard WS) at Q/A 231-232.

Moreover, a nexus to the asserted patents can be seen in the documentary evidence of Cisco's ongoing engineering and R&D activities relating to the protected articles that practice the patented features.

For example, with respect to the '145 and '592 (Private VLAN) patents, Mr. Edsall testified about his own role in the implementation of the patented PVLAN technology in Cisco products. Edsall Tr. 435 (testifying that he managed a team of Cisco engineers that incorporated PVLAN into Cisco products). In addition, Cisco's public and internal technical documentation describe Cisco's implementation of PVLAN in the DI Products. *See, e.g.*, CX-0062 (Cisco Nexus 3048 Switch Data Sheet, 2014); CX-0068 (Cisco CGS 2520 Software Configuration Guide, April 2010); CX-0069 (Cisco Nexus 3000 Series NX-OS Layer 2 Switching Configuration Guide, last modified Sept. 2014). In particular, these documents support the inference that engineers performed work during the DI investment period on the patented feature within the DI products. For example, CX-0062, dated 2014, illustrates in detail that the PVLAN feature is a part of the Nexus 3048 DI Product.

[48] As mentioned above, Cisco's domestic investments in the DI Products will be analyzed for purposes of the economic prong regardless of whether or not the DI Products are determined to have satisfied the technical prong for their respective asserted patents.

With respect to the '537 (SysDB) patent, Cisco inventor and engineer Mr. Pradeep Kathail testified regarding his own role in the implementation of the patented SysDB technology in Cisco products. Kathail Tr. 246-247 (testifying that he worked on the implementation of IOS XR, which includes the technology covered by the '537 patent in Cisco products). He further testified that he currently supervises engineers who work on designing how Cisco's products use IOS-XR. Kathail Tr. 247. Cisco's public and internal technical documentation describes SysDB and the IOS-XR software in the DI Products. *See, e.g.*, CX-0464 (Cisco IOS XR Fundamentals, June 2009); CX-0465 (Cisco CRS 4-, 8- and 16-Slot Line Card Chassis Performance Route Processors Data Sheet, 2014). In particular, these documents show that engineers in the United States worked on products that practice the patented SysDB feature. *See* CX-0464 at iv-v (describing the authors' involvement in the development of Cisco IOS-XR); *id.* at 46-50 (describing the implementation of SysDB in IOS-XR); CX-0465 at 1-2 (describing the implementation of IOS-XR on Cisco Carrier Routing System (CRS) products).

With respect to the '597 (ProcMgr) patent, Cisco's public and internal technical documentation describes OBFL, Cisco's implementation of the patented technology, in the DI Products. In particular, these documents show that engineers in the United States worked on the patented OBFL feature. *See, e.g.*, CX-0337C (Generic On-Board Failure Logging Product Requirements Document, Jan. 2013) at 2 (listing Cisco who were involved in development of the OBFL technology in the 2012-2013 time frame as shown in this Products Requirements Document, which is a technical document generated by Cisco and devoted to documenting the development of OBFL). OBFL is also discussed in Cisco configuration guides, manuals, and datasheets for Cisco's DI products. *See, e.g.*, CX-0382 (Supervisor Engine 2T Software

Configuration Guide, Release 15.2SY, Dec. 2014) at 17-1 through 17-12 (describing the implementation of OBFL in Cisco IOS Release 15.2SY).

With respect to the '164 (Zero Touch Provisioning) patent, Cisco's public and internal technical documentation describe ZTP, which Cisco refers to as "Power On Auto-Provisioning" or "POAP," in connection with the DI Products. *See, e.g.*, CX-0187 (Cisco Nexus 3000 Series NX-OS Fundamentals Configuration Guide, Release 6.x, last modified Sept. 2014); CX-0188 (Cisco Nexus 5000 Series NX-OS Fundamentals Configuration Guide, Release 5.1(3)N2(1), March 2012); CX-0220C (N7K Series PowerOn Auto-Provisioning (POAP) Software Functional/Design Specification, last modified May 2013). In particular, these documents support the inference that Cisco's engineers performed engineering and research and development work on the patented POAP feature in the DI Products. For example, CX-0220C was last modified in May 2013, and illustrates in detail that the POAP feature is a part of the Nexus 7000 products.

As such, Cisco has demonstrated that its investments in the DI Products have a direct nexus to the asserted patents.

Dr. Leonard also testified that Cisco's investments in engineering and R&D for the DI Products in the United States are substantial because they are critical to Cisco's ability to competitively sell the DI Products, and to the availability of quality products in the communications equipment industry. CX-0010C (Leonard WS) at Q/A 223-24. Dr. Leonard compared Cisco's investments in engineering and R&D for the DI Products inside the United States to those outside the United States. Total U.S. investments in engineering and R&D across all of the DI Products were a greater percentage of worldwide investments than non-U.S. investments in every fiscal year under consideration, which were fiscal years 2012 through 2015.

CX-0010C (Leonard WS) at Q/A 229. Furthermore, total U.S. investments in engineering and R&D for each of the DI Products was greater than the corresponding total non-U.S. investments in every fiscal year under consideration with just a few exceptions. *Id.*; CX-0109C (Cisco's Investments in Engineering and R&D). As discussed previously, the high relative value of U.S. investments to foreign investments demonstrates that Cisco's investments in the DI Products are substantial. Thus, Cisco's U.S. investments in engineering and R&D are substantial, including at the time the complaint was filed. CX-0010C (Leonard WS) at Q/A 222-30.

XI. Conclusions of Law

1. The Commission has subject matter, personal, and *in rem* jurisdiction in this investigation.

2. The accused Arista products have been imported into the United States.

3. Arista's accused products infringe asserted claims 1, 2, 8-11, and 17-19 of U.S. Patent No. 7,162,537; asserted claims 6, 7, 20, and 21 of U.S. Patent No. 6,741,592; and asserted claims 5, 7, 45, and 46 of U.S. Patent No. 7,200,145.

4. Arista's accused products do not infringe asserted claims 1, 14-15, 29, 39, 63-64, or 71-73 of U.S. Patent No. 7,340,597; or asserted claims 1, 5, 6, 9, or 18 of U.S. Patent No. 7,290,164.

5. The domestic industry requirement has been satisfied with respect to the infringed '537, '592, and '145 patents.

6. It has not been shown by clear and convincing evidence that the asserted claims of the patents in suit are invalid.

XII. Initial Determination on Violation

Accordingly, it is the initial determination of the undersigned that a violation of section 337 (19 U.S.C. § 1337) has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain network devices, related software and components thereof with respect to asserted claims 1, 2, 8-11, and 17-19 of U.S. Patent No. 7,162,537; asserted claims 6, 7, 20, and 21 of U.S. Patent No. 6,741,592; and asserted claims 5, 7, 45, and 46 of U.S. Patent No. 7,200,145

Further, this initial determination, together with the record of the hearing in this investigation consisting of (1) the transcript of the hearing, with appropriate corrections as may hereafter be ordered, and (2) the exhibits received into evidence in this investigation, is hereby certified to the Commission.

In accordance with 19 C.F.R. § 210.93(c), all material found to be confidential by the undersigned under 19 C.F.R. § 210.5 is to be given *in camera* treatment.

The Secretary shall serve a public version of this initial determination upon all parties of record and the confidential version upon counsel who are signatories to the Protective Order, as amended, issued in this investigation.

Pursuant to 19 C.F.R. § 210.42(h), this initial determination shall become the determination of the Commission unless a party files a petition for review pursuant to § 210.43(a) or the Commission, pursuant to § 210.44, orders on its own motion a review of the initial determination or certain issues herein.

XIII. Order

To expedite service of the public version, each party is hereby ordered to file with the Commission Secretary no later than February 9, 2016, a copy of this initial determination with brackets to show any portion considered by the party (or its suppliers of information) to be confidential,[49] accompanied by a list indicating each page on which such a bracket is to be found. At least one copy of such a filing shall be served upon the office of the undersigned, and the brackets shall be marked in red. If a party (and its suppliers of information) considers nothing in the initial determination to be confidential, and thus makes no request that any portion be redacted from the public version, then a statement to that effect shall be filed.

David P. Shaw
Administrative Law Judge

Issued: February 2, 2016

[49] Confidential business information ("CBI") is defined in accordance with 19 C.F.R. § 201.6(a) and § 210.5(a). When redacting CBI or bracketing portions of documents to indicate CBI, a high level of care must be exercised in order to ensure that non-CBI portions are not redacted or indicated. Other than in extremely rare circumstances, block-redaction and block-bracketing are prohibited. In most cases, redaction or bracketing of only discrete CBI words and phrases will be permitted.

CERTAIN NETWORK DEVICES, RELATED SOFTWARD AND COMPONENTS THEREOF (I):

INV. NO. 337-TA-944

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **INITIAL DETERMINATION** has been served by hand upon the Commission Investigative Attorney, **Andrew Beverina, Esq.**, and the following parties as indicated, on MAR 02 2016.

Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street SW, Room 112A
Washington, DC 20436

FOR COMPLAINANT CISCO SYSTEMS, INC.:	
D. Sean Trainor, Esq. **KIRKLAND & ELLIS LLP** 655 15th Street, NW Washington, DC 20005	( ) Via Hand Delivery (X) Express Delivery ( ) Via First Class Mail ( ) Other: ________
FOR RESPONDENT ARISTA NETWORKS, INC.:	
Lauren A. Degnan, Esq. **FISH & RICHARDSON P.C.** 1425 K Street, NW 11th Floor Washington, DC 20005	( ) Via Hand Delivery (X) Express Delivery ( ) Via First Class Mail ( ) Other: ________

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I)**	**Inv. No. 337-TA-944**

NOTICE OF INSTITUTION OF INVESTIGATION

Institution of investigation pursuant to 19 U.S.C. § 1337

AGENCY: U.S. International Trade Commission

ACTION: Notice

SUMMARY: Notice is hereby given that a complaint was filed with the U.S. International Trade Commission on December 19, 2014, under section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, on behalf of Cisco Systems, Inc. of San Jose, California. A supplement was filed on January 8, 2015. The complaint alleges violations of section 337 based upon the importation into the United States, the sale for importation, and the sale within the United States after importation of certain network devices, related software and components thereof by reason of infringement of certain claims of U.S. Patent No. 7,162,537 ("the '537 patent"); U.S. Patent No. 8,356,296 ("the '296 patent"); U.S. Patent No. 7,290,164 ("the '164 patent"); U.S. Patent No. 7,340,597 ("the '597 patent"); U.S. Patent No. 6,741,592 ("the '592 patent"); and U.S. Patent No. 7,200,145 ("the '145 patent"), and alleges that an industry in the United States exists as required by subsection (a)(2) of section 337.

The complainant requests that the Commission institute an investigation and, after the investigation, issue a limited exclusion order and a cease and desist order.

ADDRESSES: The complaint, except for any confidential information contained therein, is available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Room 112, Washington, D.C. 20436, telephone (202) 205-2000. Hearing impaired individuals are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at (202) 205-2000. General information concerning the Commission may also be obtained by accessing its internet server at http://www.usitc.gov. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at http://edis.usitc.gov.

FOR FURTHER INFORMATION CONTACT: The Office of Unfair Import Investigations, U.S. International Trade Commission, telephone (202) 205-2560.

AUTHORITY: The authority for institution of this investigation is contained in section 337 of the Tariff Act of 1930, as amended, and in section 210.10 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.10 (2014).

SCOPE OF INVESTIGATION: Having considered the complaint, the U.S. International Trade Commission, on January 20, 2015, **ORDERED THAT** –

(1) Pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, an investigation be instituted to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain network devices, related software and components thereof by reason of infringement of one or more of claims 1, 2, 8-11, and 17-19 of the '537 patent; claims 1, 6, and 12 of the '296 patent; claims 1, 5, 6, 9, and 18 of the '164 patent; claims 1, 14, 15, 29, 39-42, 63, 64, 71-73, and 84-86 of the '597 patent; claims 6-10, 17, 18, 20, 21, 23, and 24 of the '592 patent; claims 1, 3, 5, 7-11, 13, 15-29, 33-37, and 39-46 of the '145 patent, and whether an industry in the United States exists as required by subsection (a)(2) of section 337;

(2) For the purpose of the investigation so instituted, the following are hereby named as parties upon which this notice of investigation shall be served:

(a) The complainant is:

Cisco Systems, Inc.
170 W Tasman Drive
San Jose, CA 95134

(b) The respondent is the following entity alleged to be in violation of section 337, and is the party upon which the complaint is to be served:

Arista Networks, Inc.
5453 Great America Parkway
Santa Clara, CA 95054

(c) The Office of Unfair Import Investigations, U.S. International Trade Commission, 500 E Street, S.W., Suite 401, Washington, D.C. 20436; and

(3) For the investigation so instituted, the Chief Administrative Law Judge, U.S. International Trade Commission, shall designate the presiding Administrative Law Judge, and the Chief Administrative Law Judge is authorized to consider whether to consolidate Inv. No. 337–TA–944 with Inv. No. 337-TA-945, and to consolidate them if he deems it appropriate.

Responses to the complaint and the notice of investigation must be submitted by the named respondent in accordance with section 210.13 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.13. Pursuant to 19 C.F.R. §§ 201.16(e) and 210.13(a), such responses will be considered by the Commission if received not later than 20 days after the date of service by the Commission of the complaint and the notice of investigation. Extensions of time for submitting responses to the complaint and the notice of investigation will not be granted unless good cause therefor is shown.

Failure of the respondent to file a timely response to each allegation in the complaint and in this notice may be deemed to constitute a waiver of the right to appear and contest the allegations of the complaint and this notice, and to authorize the administrative law judge and the Commission, without further notice to the respondent, to find the facts to be as alleged in the complaint and this notice and to enter an initial determination and a final determination containing such findings, and may result in the issuance of an exclusion order or a cease and desist order or both directed against the respondent.

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued: January 21, 2015

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I)**	**Inv. No. 337-TA-944**

DESIGNATION OF OUII ATTORNEY
FOR SERVICE OF PROCESS

The Office of Unfair Import Investigations ("OUII") hereby designates Andrew Beverina, Esq., (202) 205-2077, Andrew.Beverina@usitc.gov, as OUII's lead attorney for service of process. It is requested that all documents served by the Commission or filed by the parties in the above-referenced investigation be served upon this attorney.

Respectfully submitted,

Margaret D Macdonald

Margaret Macdonald Director

OFFICE OF UNFAIR IMPORT INVESTIGATIONS
U.S. International Trade Commission
500 E Street, S.W., Suite 401
Washington, D.C. 20436
(202) 205-2560
(202) 205-2158 (facsimile)

January 21, 2015

CERTAIN NETWORK DEVICES, RELATED SOFTWARE AND COMPONENTS THEREOF (I) **Inv. No. 337-TA-944**

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **NOTICE OF INSTITUTION OF INVESTIGATION** has been served by hand upon the Commission Investigative Attorney, **Andrew Beverina, Esq.**, and the following parties as indicated, on January 21, 2015.

Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

Complainants:

Cisco Systems, Inc.
170 W. Tasman Drive
San Jose, CA 95134

☐ Via Hand Delivery
☒ Via Express Delivery
☐ Via First Class Mail
☐ Other:____________

On Behalf of Complainants:

D. Sean Trainor
KIRKLAND & ELLIS LLP
655 15th Street N. W.
Washington, DC 20005

☐ Via Hand Delivery
☒ Via Express Delivery
☐ Via First Class Mail
☐ Other:____________

Respondents:

Arista Networks, Inc.
5453 Great America Parkway
Santa Clara, CA 95054

☐ Via Hand Delivery
☒ Via Express Delivery
☐ Via First Class Mail
☐ Other:____________

Government Agencies:

Edward T. Hand, Chief
Foreign Commerce Section
Antitrust Division
U.S. Department of Justice
450 5th Street NW, Room 11000
Washington, DC 20530

☐ Via Hand Delivery
☐ Via Express Delivery
☒ Via First Class Mail
☐ Other:____________

U.S. Bureau of Customs and Border Protection
Intellectual Property Rights Branch

☐ Via Hand Delivery
☐ Via Express Delivery

Mint Annex Building
799 9th Street, NW, 7th floor
Washington, DC 20229-1177

☒ Via First Class Mail
☐ Other:____________

Elizabeth Kraus, Deputy Director
International Antitrust, Office of International Affairs
Federal Trade Commission
600 Pennsylvania Avenue, Room 498
Washington, DC 20580

☐ Via Hand Delivery
☐ Via Express Delivery
☒ Via First Class Mail
☐ Other:____________

Dale D. Berkley, Ph.D., J.D.
Office of the General Counsel, PHD, NIH Branch
National Institutes of Health
31 Center Drive
Bldg. 31, Rm. 47
Bethesda, MD 20892

☐ Via Hand Delivery
☐ Via Express Delivery
☒ Via First Class Mail
☐ Other:____________

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, DC 20436

January 21, 2015

Cisco Systems, Inc.
170 W. Tasman Drive
San Jose, CA 95134

Re: Certain Network Devices, Related Software and Components Thereof (I)
Inv. No. 337-TA-944

Dear Sir/Madam:

This letter is to advise you that the U.S. International Trade Commission has instituted an investigation pursuant to section 337 of the Tariff Act of 1930 (19 U.S.C. 1337). A copy of the Commission's notice of investigation is enclosed. Also enclosed is the Section 337 Mediation Program brochure. After reviewing the brochure, please sign and return the enclosed certification of receipt.

Sincerely,

Lisa R. Barton
Secretary

Enclosures:
1. Notice of Investigation
2. Publication No. 4497 Regarding the Section 337 Mediation Program
3. Certification of Receipt of Mediation Materials

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, DC 20436

January 21, 2015

D. Sean Trainor, Esq.
Kirkland & Ellis LLP
655 15th Street, NW
Washington, DC 20005

Re: Certain Network Devices, Related Software and Components Thereof (I)
Inv. No. 337-TA-944

Dear Mr. Trainor:

This letter is to advise you that the U.S. International Trade Commission has instituted an investigation pursuant to section 337 of the Tariff Act of 1930 (19 U.S.C. 1337). A copy of the Commission's notice of investigation is enclosed. Also enclosed is the Section 337 Mediation Program brochure. After reviewing the brochure, please sign and return the enclosed certification of receipt.

Sincerely,

Lisa R. Barton
Secretary

Enclosures:
1. Notice of Investigation
2. Publication No. 4497 Regarding the Section 337 Mediation Program
3. Certification of Receipt of Mediation Materials

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, DC 20436

January 21, 2015

Arista Networks, Inc.
5453 Great American Parkway
Santa Clara, CA 95054

Re: Certain Network Devices, Related Software and Components Thereof (I)
Inv. No. 337-TA-944

Dear Sir/Madam:

This letter is to advise you that the United States International Trade Commission has instituted an investigation pursuant to Section 337 of the Tariff Act of 1930 (19 U.S.C. 1337). **Arista Networks, Inc.** is a named respondent in this investigation.

We are hereby serving you with a copy of the Complaint and the Notice of Investigation issued in this matter. Enclosed is a copy of the Code of Federal Regulations. Also enclosed is a the Section 337 Mediation Program brochure. After reviewing this brochure, please sign and return the enclosed certification of receipt.

Please note that the Notice requires a response to the allegations in the Complaint and the response must be received not later than twenty (20) days after the date of service of the Complaint. Failure to file a response may result in inferences being drawn against your interests.

Sincerely,

Lisa R. Barton
Secretary

Enclosures:

1. Complaint
2. Notice of Investigation
3. Code of Federal Regulation
4. Publication No. 4497 Regarding the Section 337 Mediation Program
5. Certification of Receipt of Mediation Materials

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, DC 20436

January 21, 2015

Edward T. Hand, Chief
Foreign Commerce Section
Antitrust Division
U.S. Dept of Justice
450 5th Street NW, Room 11000
Washington, DC 20530

Re: Certain Network Devices, Related Software and Components Thereof
Inv. No. 337-TA-944

Dear Mr. Hand:

This letter is to advise you that the United States International Trade Commission has instituted an investigation pursuant to Section 337 of the Tariff Act of 1930 (19 U.S.C. 1337). A copy of the Notice of Investigation is enclosed. Non-confidential copies of the Complaint and any supplements filed in the investigation will be provided upon request. Requests should be directed to Sally Bromley, Case Manager to the Hon. David P. Shaw at (202) 708-4170.

If you have any questions concerning this investigation, please contact the Commission Investigative Attorney whose name and telephone number appear in the enclosed Notice.

Sincerely,

Lisa R. Barton
Secretary

Enclosure:
1. Notice of Investigation

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, DC 20436

January 21, 2015

Intellectual Property Rights Branch
Regulations and Rulings
Office of International Trade
U.S. Customs and Border Protection
90 K Street, NE, 10th Floor
Washington, DC 20229-1177

Re: Certain Network Devices, Related Software and Components Thereof
Inv. No. 337-TA-944

Dear Sir/Madam:

This letter is to advise you that the United States International Trade Commission has instituted an investigation pursuant to Section 337 of the Tariff Act of 1930 (19 U.S.C. 1337). A copy of the Notice of Investigation is enclosed. Non-confidential copies of the Complaint and any supplements filed in the investigation will be provided upon request. Requests should be directed to Sally Bromley, Case Manager to the Hon. David P. Shaw at (202) 708-4170.

If you have any questions concerning this investigation, please contact the Commission Investigative Attorney whose name and telephone number appear in the enclosed Notice.

Sincerely,

Lisa R. Barton
Secretary

Enclosure:
1. Notice of Investigation

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, DC 20436

January 21, 2015

Elizabeth Kraus, Deputy Director
International Antitrust, Office of International Affairs
Federal Trade Commission
600 Pennsylvania Avenue, Room 498
Washington, DC 20580

Re: Certain Network Devices, Related Software and Components Thereof
Inv. No. 337-TA-944

Dear Ms. Kraus:

This letter is to advise you that the United States International Trade Commission has instituted an investigation pursuant to Section 337 of the Tariff Act of 1930 (19 U.S.C. 1337). A copy of the Notice of Investigation is enclosed. Non-confidential copies of the Complaint and any supplements filed in the investigation will be provided upon request. Requests should be directed to Sally Bromley, Case Manager to the Hon. David P. Shaw at (202) 708-4170.

If you have any questions concerning this investigation, please contact the Commission Investigative Attorney whose name and telephone number appear in the enclosed Notice.

Sincerely,

Lisa R. Barton
Secretary

Enclosure:
1. Notice of Investigation

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, DC 20436

January 21, 2015

Dale D. Berkley, Ph.D., J.D.
Office of General Counsel, PHD, NIH Branch
National Institutes of Health
31 Center Drive
Bldg. 31, Rm. 47
Bethesda, MD 20892

Re: Certain Network Devices, Related Software and Components Thereof
Inv. No. 337-TA-944

Dear Dr. Berkley:

This letter is to advise you that the United States International Trade Commission has instituted an investigation pursuant to Section 337 of the Tariff Act of 1930 (19 U.S.C. 1337). A copy of the Notice of Investigation is enclosed. Non-confidential copies of the Complaint and any supplements filed in the investigation will be provided upon request. Requests should be directed to Sally Bromley, Case Manager to the Hon. David P. Shaw at (202) 708-4170.

If you have any questions concerning this investigation, please contact the Commission Investigative Attorney whose name and telephone number appear in the enclosed Notice.

Sincerely,

Lisa R. Barton
Secretary

Enclosure:
1. Notice of Investigation

Inv. No. 337-TA-944
JX 0001

C 7486764

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

July 18, 2014

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF:

U.S. PATENT: *7,162,537*
ISSUE DATE: *January 09, 2007*

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

W. Montgomery
W. MONTGOMERY
Certifying Officer

CSI-ANI-00128364

US007162537B1

(12) **United States Patent**
Kathail

(10) **Patent No.: US 7,162,537 B1**
(45) **Date of Patent: Jan. 9, 2007**

(54) **METHOD AND SYSTEM FOR EXTERNALLY MANAGING ROUTER CONFIGURATION DATA IN CONJUNCTION WITH A CENTRALIZED DATABASE**

(75) Inventor: **Pradeep Kathail**, Sunnyvale, CA (US)

(73) Assignee: **Cisco Technology, Inc.**, San Jose, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/479,607**

(22) Filed: **Jan. 6, 2000**

(51) **Int. Cl.**
G06F 15/173 (2006.01)
G06F 7/00 (2006.01)
H04L 12/28 (2006.01)

(52) **U.S. Cl.** **709/238**; 370/351; 707/10; 707/102

(58) **Field of Classification Search** 707/1–2; 709/223, 238, 239, 242–244
See application file for complete search history.

(56) **References Cited**

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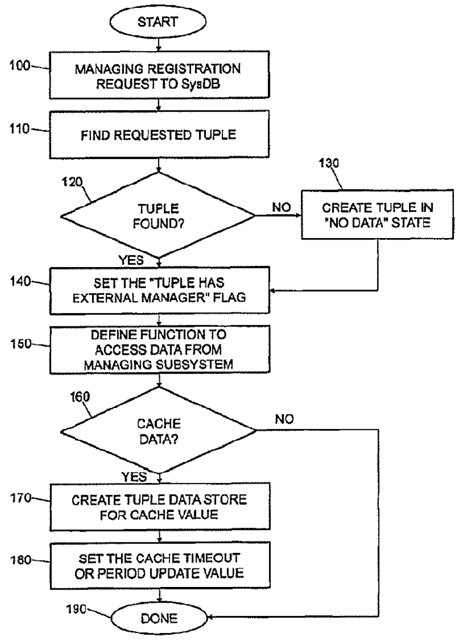
* cited by examiner

Primary Examiner—David Wiley
Assistant Examiner—George C. Neurauter, Jr.
(74) *Attorney, Agent, or Firm*—Sierra Patent Group, Ltd.

(57) **ABSTRACT**

A method and system for externally managing router configuration data in conjunction with a centralized database subsystem in a router device. The centralized database provides external management registration and unregistration for various managing router subsystems associated with said database system. The centralized database and the subsystems registered for external data management engage in transaction request sequences to provide router data requested by other client subsystems. The arrangement of the various client subsystems associated with the database subsystem allows the client subsystems to remain modular and independent of each other.

22 Claims, 8 Drawing Sheets


START
100
MANAGING REGISTRATION REQUEST TO SysDB
110
FIND REQUESTED TUPLE
120
TUPLE FOUND?
NO
130
CREATE TUPLE IN "NO DATA" STATE
YES
140
SET THE "TUPLE HAS EXTERNAL MANAGER" FLAG
150
DEFINE FUNCTION TO ACCESS DATA FROM MANAGING SUBSYSTEM
160
CACHE DATA?
NO
YES
170
CREATE TUPLE DATA STORE FOR CACHE VALUE
180
SET THE CACHE TIMEOUT OR PERIOD UPDATE VALUE
190
DONE

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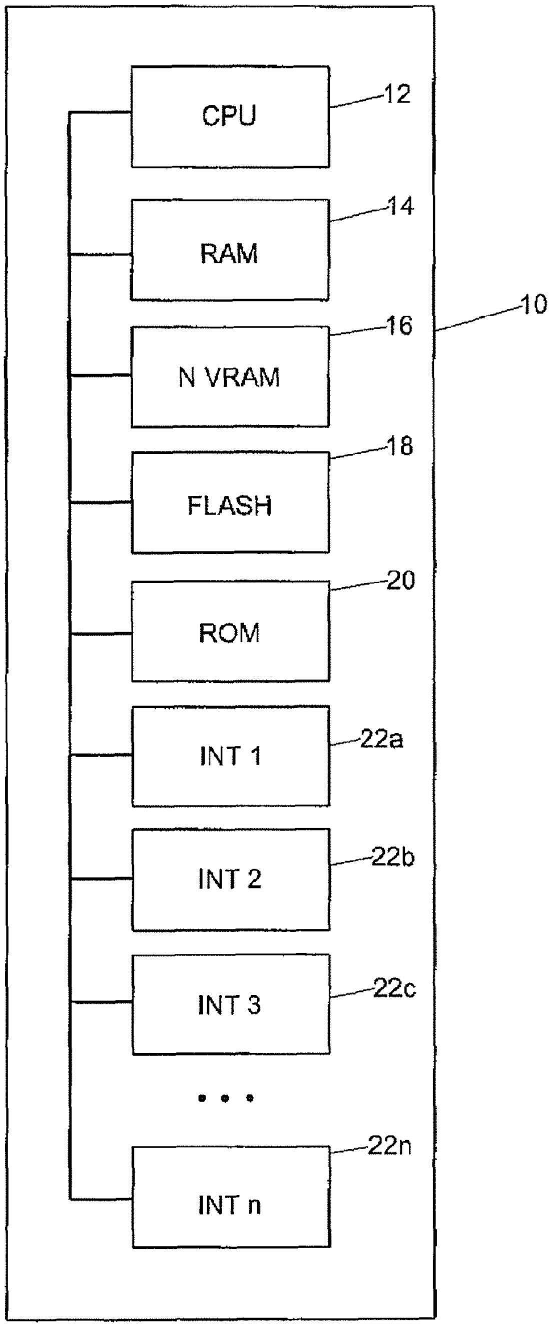
CPU
12
RAM
14
10
16
N VRAM
18
FLASH
20
ROM
INT 1
22a
INT 2
22b
INT 3
22c
• • •
22n
INT n

FIG. 1

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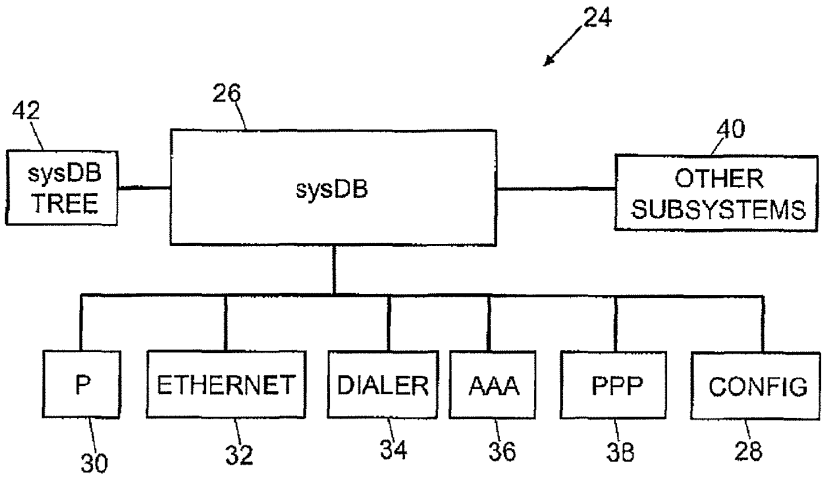
24
26
42
sysDB TREE
sysDB
40
OTHER SUBSYSTEMS
P
ETHERNET
DIALER
AAA
PPP
CONFIG
30
32
34
36
38
28

FIG. 2

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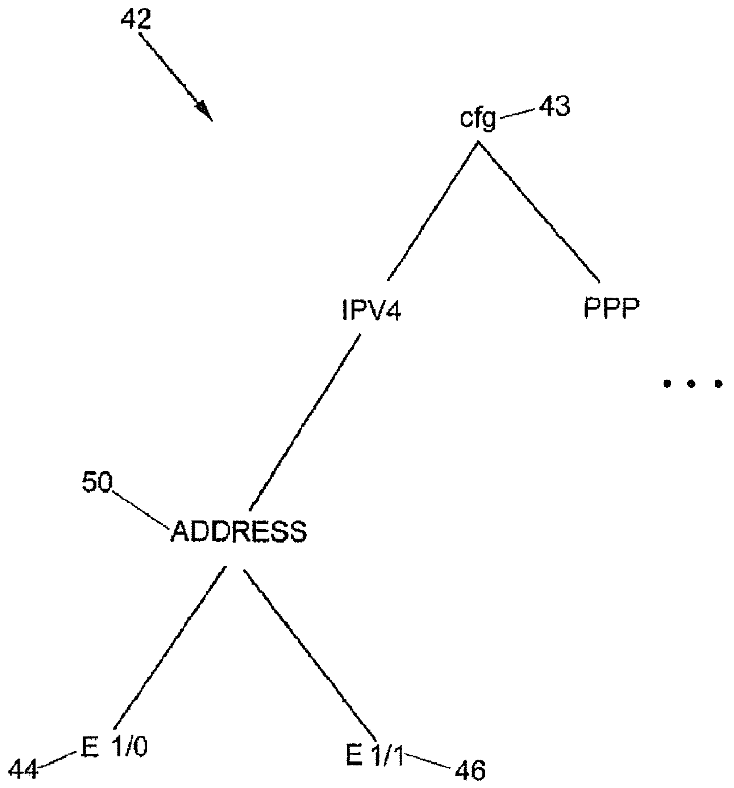
42
cfg
43
IPV4
PPP
• • •
50
ADDRESS
E 1/0
44
E 1/1
46

FIG. 3

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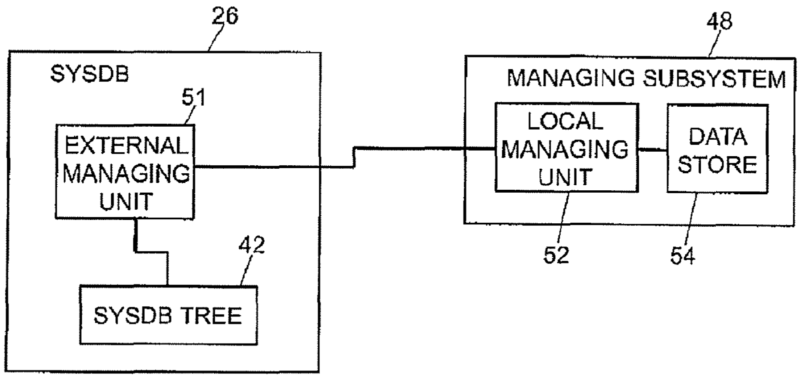
26
SYSDB
51
EXTERNAL MANAGING UNIT
42
SYSDB TREE
48
MANAGING SUBSYSTEM
LOCAL MANAGING UNIT
DATA STORE
52
54

FIG. 4

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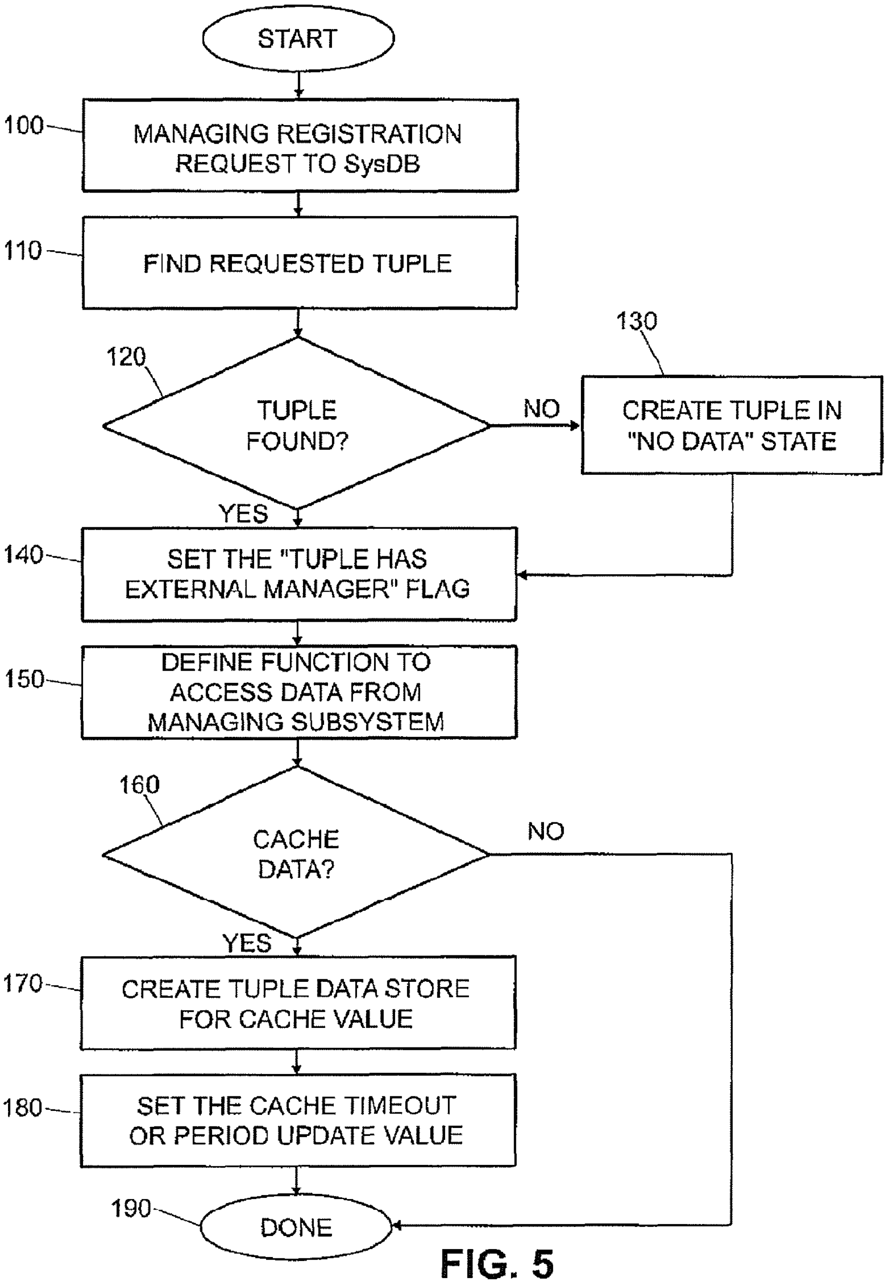
START
100
MANAGING REGISTRATION REQUEST TO SysDB
110
FIND REQUESTED TUPLE
120
TUPLE FOUND?
NO
130
CREATE TUPLE IN "NO DATA" STATE
YES
140
SET THE "TUPLE HAS EXTERNAL MANAGER" FLAG
150
DEFINE FUNCTION TO ACCESS DATA FROM MANAGING SUBSYSTEM
160
CACHE DATA?
NO
YES
170
CREATE TUPLE DATA STORE FOR CACHE VALUE
180
SET THE CACHE TIMEOUT OR PERIOD UPDATE VALUE
190
DONE

FIG. 5

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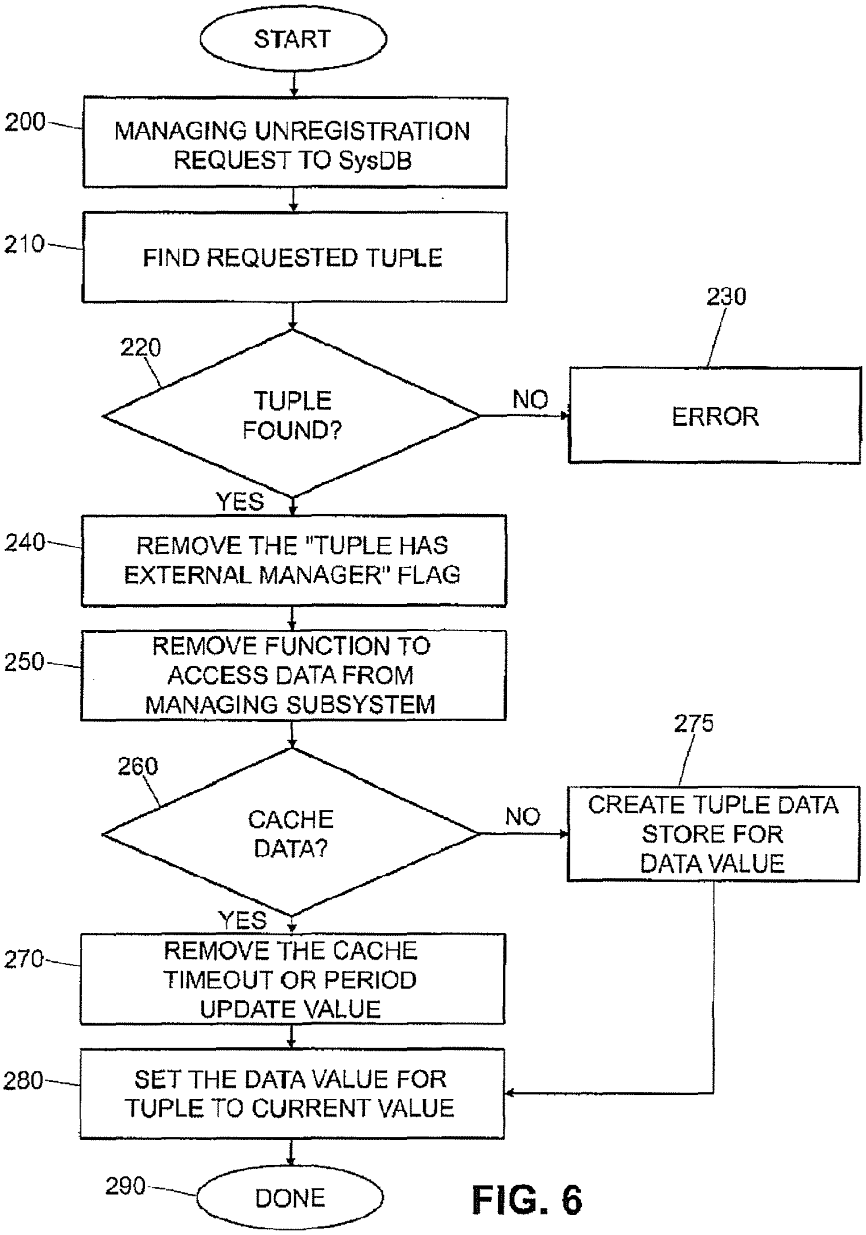
START
200
MANAGING UNREGISTRATION REQUEST TO SysDB
210
FIND REQUESTED TUPLE
220
TUPLE FOUND?
NO
230
ERROR
YES
240
REMOVE THE "TUPLE HAS EXTERNAL MANAGER" FLAG
250
REMOVE FUNCTION TO ACCESS DATA FROM MANAGING SUBSYSTEM
260
CACHE DATA?
NO
275
CREATE TUPLE DATA STORE FOR DATA VALUE
YES
270
REMOVE THE CACHE TIMEOUT OR PERIOD UPDATE VALUE
280
SET THE DATA VALUE FOR TUPLE TO CURRENT VALUE
290
DONE

FIG. 6

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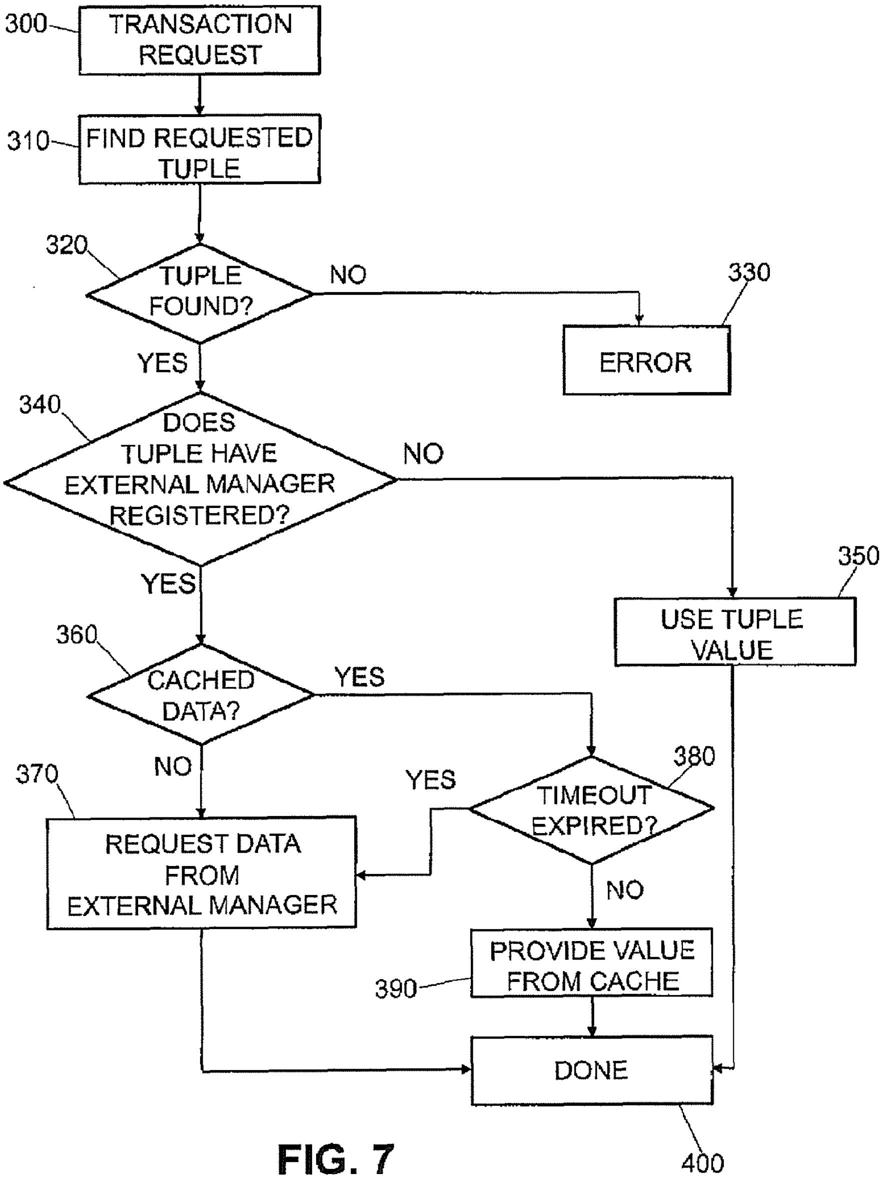

300
TRANSACTION REQUEST
310
FIND REQUESTED TUPLE
320
TUPLE FOUND?
NO
330
ERROR
YES
340
DOES TUPLE HAVE EXTERNAL MANAGER REGISTERED?
NO
350
USE TUPLE VALUE
YES
360
CACHED DATA?
YES
380
TIMEOUT EXPIRED?
YES
NO
370
REQUEST DATA FROM EXTERNAL MANAGER
NO
PROVIDE VALUE FROM CACHE
390
DONE
400

FIG. 7

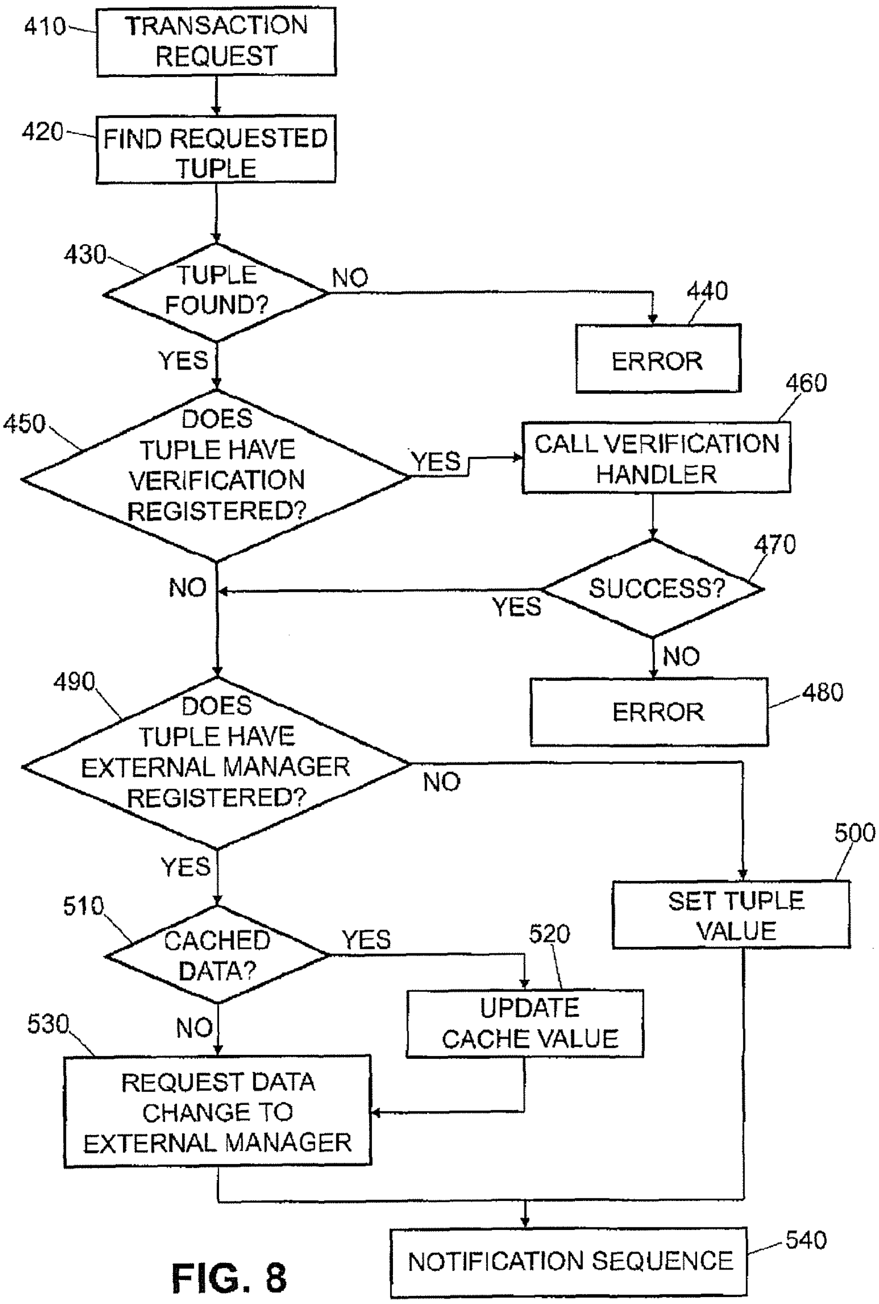
410
TRANSACTION REQUEST
420
FIND REQUESTED TUPLE
430
TUPLE FOUND?
NO
440
ERROR
YES
450
DOES TUPLE HAVE VERIFICATION REGISTERED?
YES
460
CALL VERIFICATION HANDLER
470
SUCCESS?
YES
NO
NO
480
ERROR
490
DOES TUPLE HAVE EXTERNAL MANAGER REGISTERED?
NO
YES
500
SET TUPLE VALUE
510
CACHED DATA?
YES
520
UPDATE CACHE VALUE
530
NO
REQUEST DATA CHANGE TO EXTERNAL MANAGER
540
NOTIFICATION SEQUENCE

FIG. 8

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METHOD AND SYSTEM FOR EXTERNALLY MANAGING ROUTER CONFIGURATION DATA IN CONJUNCTION WITH A CENTRALIZED DATABASE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention pertains generally to internetwork router operating systems. More particularly, the invention is a method and system for managing data externally in a centralized database system for a router operating system.

2. The Prior Art

In a routing device, internetwork operating systems (IOS) or more commonly, router operating systems (OS), provide the basic command functions for the routing device as well as various subsystem components which provide specific functions or routines provided by the routing device.

In general, routing devices carry out the operation of reliably transferring network messages or packets between a network of coupled devices, or a collection of such networks. A reliable transfer protocol is provided by the IOS for carrying out such operation. Additionally, an interface in communication with a Configuration (config) subsystem is provided which allows a user of the routing device to configure the operations of the routing device.

The user may configure, for example, the IP address of an Ethernet interface facility or the default route for the routing device. A config command issued by the user is received by the config subsystem and processed therein. The config subsystem determines from the config command issued by the user which client subsystem is affected by configuration information contained in the config command. The config subsystem then carries out a communication exchange with the affected client subsystem to deliver the change in configuration information.

However, router devices typically include a plurality of client subsystems which manage specific functions, requiring multiple dependencies between the config subsystem and such client subsystems. Furthermore, client subsystems often have multiple dependencies with other client subsystem. For example, the PPP subsystem is dependent upon the IP subsystem for Internet address information and the AAA subsystem for user authentication and credential information. These and other subsystem dependencies as is known in the art prevent modularity in subsystem design and implementation within the IOS of the router.

Another drawback with current subsystem implementation schemes arises when temporary configuration changes to a subsystem are to be carried out. A temporary change is desired when, for example, a user of the routing device wishes to test a particular configuration to analyze the efficiency of such configuration, but would like the opportunity to subsequently revert or "back-out" of the change if desired. During such a configuration sequence, multiple transactions will typically need to be carried out between various subsystems. For example, where a user configures the IP address of an Ethernet facility port, the config subsystem will communicate the new IP address to the IP subsystem. In turn, the IP subsystem will communicate to the Ethernet subsystem that Ethernet facility port has new IP address information. When the changes are to be aborted or otherwise reverted, a similar chain of communication is necessary to complete the task of reverting prior changes. Such multiple dependencies between the various subsystems of the IOS make common transactions cumbersome and unnecessarily complicated. Furthermore, design and development of the various subsystems of the IOS must take into account these multiple dependencies requiring longer design and development time.

Another situation where a temporary change is desired is when a user connects to the router via a "dial-in" connection port. Dial-in connections are provided by a plurality of subsystem of the IOS. Certain default settings may be configured for most users. However, specialized settings may be configured for certain users, such as network administrators who have particular access privileges, for example. Where a user connects via a dial-in connection, a dialer subsystem communicates with an AAA subsystem to provide name and password information. Responsive to this communication, the AAA subsystem determines the access credentials of the dial-in user from the name and password information and communicates with a PPP subsystem. The access credentials provide, among other things, the configurations for the user at the dial-in connection port. The PPP subsystem then sets the port configurations for the user according to the user's access credentials thereby enabling point-to-point communication for the user.

When the user disconnects, the PPP subsystem, the AAA subsystem and the dialer subsystem need to communicate with each other to restore default settings. This situation presents another illustration where multiple dependencies between the various subsystems of the IOS make common transactions cumbersome and unnecessarily complicated.

Yet another disadvantage with current IOS transaction methods arises when a configuration command issued by a remote user of the routing device causes the user to be disconnected. Such configuration commands while not permanent prevent the user from remotely reconnecting to the routing device to correct the configuration. Normally, the user would need to directly interface with the routing device to correct the configuration, or otherwise manually restart or "reboot" the routing device to discard the current configuration and restore the previous configuration. Current transaction methods do not provide a facility or method for sensing such disconnection events and for restoring the previous connection upon the discovery of such disconnection.

Copending application entitled METHOD AND SYSTEM FOR EXECUTING, TRACKING AND RESTORING TEMPORARY ROUTER CONFIGURATION CHANGE USING A CENTRALIZED DATABASE, filed Oct. 12, 1999, describes a method and system for transacting routing device configurations using a centralized information provider or database system and is incorporated herein by reference. In this copending application, a centralized database system (sysDB) is provided within the IOS which manages transactions on router configuration data. The sysDB receives configuration commands from various IOS subsystems. Such commands may include, for example, a request to change configuration data and a request to revert changes made to the configuration data. Use of the sysDB allows the system to be modular and avoid unnecessary dependencies between subsystem components.

However, the centralized database scheme is somewhat inefficient when the information stored in the database contains a large amount of data or is changing very fast. For example, when the data in the database is constantly changing (such as statistic counters), the sysDB may have to continuously perform transaction routines, notification routines, and verification routines. The verification routine is described in further detail in copending application entitled METHOD AND SYSTEM FOR VERIFYING CONFIGURATION TRANSACTIONS MANAGED BY A CEN-

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TRALIZED DATABASE filed on Oct. 12, 1999 which is incorporated by reference herein. The notification routine is described in further detail in copending application entitled SUBSYSTEM APPLICATION NOTIFICATION METHOD IN A CENTRALIZED ROUTER DATABASE, filed Oct. 12, 1999 and is incorporated herein by reference.

On the other hand, if the constantly changing data is stored outside (externally) of the centralized database, subsystem applications may become aware of the other applications storing the external data, which may cause the system to become dependent upon these other applications, and therefore cause the system to be non-modular.

Accordingly, there is a need for a method and system for externally managing router configuration data in conjunction with a centralized database which allows the various subsystems of the IOS to be modular and independent. The present invention satisfies these needs, as well as others, and generally overcomes the deficiencies found in the background art.

An object of the invention is to provide a method and system for externally managing router configuration data which overcomes the prior art.

Another object of the invention is to provide a method and system for externally managing router configuration data in conjunction with a centralized database system.

Another object of the invention is to provide a method and system for externally managing router configuration data which does not require multiple dependencies between subsystem applications of the router.

Another object of the invention is to provide a method and system for externally managing router configuration data which allows the subsystem applications of the router to be modular and independent of each other.

Further objects and advantages of the invention will be brought out in the following portions of the specification, wherein the detailed description is for the purpose of fully disclosing the preferred embodiment of the invention without placing limitations thereon.

BRIEF DESCRIPTION OF THE INVENTION

The present invention is a method and system for managing data externally in conjunction with a centralized information provider or database system. The method of the invention is provided by operating system software which is run or otherwise executed on the routing device (router). The invention further relates to machine readable media on which are stored embodiments of the present invention. It is contemplated that any media suitable for retrieving instructions is within the scope of the present invention. By way of example, such media may take the form of magnetic, optical, or semiconductor media. The invention also relates to data structures that contain embodiments of the present invention, and to the transmission of data structures containing embodiments of the present invention.

In its most general terms, the method of the invention comprises software routines and algorithms which are generally provided as part of an operating system which is executed in a router device. The operating system software which is also known as internetwork operating system (IOS) comprises a plurality of subsystems, each of which perform functions for the router.

One of the subsystems provided by the IOS is a centralized database system (sysDB). The sysDB executes as a subsystem component in the router and provides a centralized storage and retrieval facility for configuration information required by other subsystems of the IOS. The configuration information stored on the sysDB may include, for example, Internet protocol (IP) addresses, Ethernet configurations, subnet masks, default routes, protocol configuration, name server information, user and password data, access levels, and other router data as is known in the art. As noted above, prior art router implementations have required the individual subsystems to handle storage and retrieval of configuration information related to the corresponding subsystem (i.e., IP subsystems contained IP configuration data, AAA subsystems contained user authentication information). The present invention employs a centralized sysDB which handles storage and retrieval tasks normally assigned to various subsystems. By centralizing such configuration information in a sysDB, multiple dependencies between the other individual subsystem are avoided or greatly reduced. This arrangement allows the subsystem design and implementation to be modular. Subsystems may be added and removed with greater ease due to the lack of multiple and prevalent dependencies.

According to another aspect of the sysDB, certain router configuration information (such as fast changing data or large amounts of data, for example) may be managed externally from the sysDB in one of the other client subsystems. For example, network interface statistic counter information may be managed by the interference management subsystem. Modularity and independence is provided by allowing the externally maintained data to be retrieved from the sysDB, rather than through the externally managing subsystem, as described further below.

The sysDB subsystem preferably employs a hierarchical name space scheme in a tree format (sysDB tree) for data storage and retrieval of configuration and other information for the router. Each branch or leaf on the tree is treated as a node or a "tuple". In an illustrative example, the sysDB tree employs a naming convention analogous to the UNIX® file system where intermediate nodes of the tree are analogous to UNIX® directories and where leaf nodes are treated as files and data which are associated with the files. In the preferred embodiment, each node or tuple in the sysDB tree has a pointer to its parent node, a pointer to its next peer, and a pointer to its first child. With this arrangement, all the children of a tuple can be iterated by using the first child as the head of a link list and traversing through the corresponding peer of each child. While the sysDB described above employs a tree structure for data storage and retrieval, other data storage facilities known in the art may be utilized including, for example, a table, b-tree or relational table scheme without deviating from present invention disclosed herein.

The sysDB subsystem is operatively coupled to the other subsystems of the IOS for providing transactional services. An illustrative IOS may include an Internet protocol (IP) subsystem, an Ethernet subsystem, a dialer subsystem, a point-to-point (PPP) subsystem, an authentication (AAA) subsystem, and a config subsystem, each subsystem operatively coupled to the sysDB subsystem, but not coupled to each other. As is known in the art, the IP subsystem manages the Internet addresses for various port facilities on the router; the Ethernet subsystem manages the Ethernet port facilities on the router; the dialer subsystem manages the dial-in communication access; the PPP subsystem manages the point to point protocol functions on the router; the AAA subsystem manages the user authentication process on the router; and the config subsystem provides configuration management for the router.

The sysDB further includes an external managing unit coupled for communication to the sysDB tree and to other

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subsystems which provide router configuration data externally. The external managing unit carries out the operating of registering and unregistering subsystems for external data managing services. The external managing unit further carries out the operation of providing transaction access to such externally managed data to client subsystems requesting such data.

Managing subsystems (which provide configuration data externally from the sysDB) further include a local managing unit coupled for communication to the external managing unit of the sysDB and a local data store. The local managing unit is coupled to the local data store for managing the external router data within the local data store and providing the router data to the external managing unit of the sysDB upon request. The local managing unit also carries out the operation of registering and unregistering with the sysDB for external data managing services.

A managing subsystem registers for external data managing services with the sysDB by transmitting a "managing" registration request. The managing subsystem may register to externally manage router configuration data which would otherwise be maintained within the sysDB tree. Accordingly, the managing subsystem may register to externally manage an individual tuple of the sysDB tree or an entire sub-tree (or namespace) of the sysDB tree. Upon registering, the subsystem indicates whether the externally managed data may be "cached" (locally copied) in the sysDB tree, in which case the managing subsystem may further indicate when the cached data expires (timeout) or may later invalidate the cached data. The managing subsystem further indicates a lookup address (or function) from which the sysDB may obtain the externally managed data from the managing subsystem.

When a request is made to the sysDB for data which is externally managed, the sysDB provides the requested data from the cache if the data is resident in the cache and the data has not expired (or otherwise been invalidated). For other data (non-cached or expired data), the sysDB accesses the lookup address (or function) to provide the data value requested by the requesting subsystems.

It is noted that according the present invention, router configuration data is requested from the sysDB by requesting subsystems, thus providing independence between the various subsystems of the IOS. That is, requesting subsystem do not request data from managing subsystems, but rather from the sysDB. However, by providing a method and apparatus for externally managing data as described herein, the disadvantages associated a centralized database (such overhead with fast changing or large data, for example) can be avoided or otherwise reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more fully understood by reference to the following drawings, which are for illustrative purposes only.

FIG. **1** is a block diagram of a router device suitable for use with the present invention.

FIG. **2** is a block diagram of an internetwork operating system in accordance with the present invention.

FIG. **3** is a block diagram of an exemplary tree structure for data storage suitable of use with the present invention.

FIG. **4** is a block diagram depicting the relationship between a managing subsystem and the sysDB.

FIG. **5** is a flow chart showing generally the actions involved in registering for external data managing services in accordance with the present invention.

FIG. **6** is a flow chart showing generally the actions involved in unregistering from external data managing services in accordance with the present invention.

FIG. **7** is a flow chart showing generally the actions involved in handling a request transaction in accordance with the present invention.

FIG. **8** is a flow chart showing generally the actions involved in handling a change transaction in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Persons of ordinary skill in the art will realize that the following description of the present invention is illustrative only and not in any way limiting. Other embodiments of the invention will readily suggest themselves to such skilled persons having the benefit of this disclosure.

Referring more specifically to the drawings, for illustrative purposes the present invention is embodied in the apparatus shown FIG. **1** through FIG. **4** and the method outlined in FIG. **5** through FIG. **8**. It will be appreciated that the apparatus may vary as to configuration and as to details of the parts, and that the method may vary as to details and the order of the actions, without departing from the basic concepts as disclosed herein. The invention is disclosed generally in terms of a method and system for carrying managing external router data in conjunction with a centralized database, although numerous other uses for the invention will suggest themselves to persons of ordinary skill in the art.

Referring first to FIG. **1**, there is shown generally a block diagram of a router device **10** suitable for use with the present invention. The router device **10** includes circuitry or like hardware components well known by those in the art and comprises a CPU **12**, random access memory (RAM) **14** operatively coupled to the CPU **12**, non-volatile memory (NVRAM) **16** operatively coupled to the CPU **12**, flash memory (FLASH) **18** operatively coupled to the CPU **12**, and read-only memory (ROM) **20** operatively coupled to the CPU **12**.

The router device **10** further includes a plurality of interface facilities (INT) **22***a* through **22***n*, each of which are operatively coupled to the CPU **12**. The interface facilities (INT) **22***a* through **22***n* comprise typical ports known in the art which connect to external input/output (I/O) devices. For example, INT **22***a* may comprise a console port, INT **22***b* may comprise an Ethernet port, INT **22***c* may comprise an auxiliary port, and INT **22***d* may comprise a serial port. Various other port configurations as is known in the art may be arranged without deviating from the present invention.

The CPU **12** carries out the computational tasks associated with executing and running the internetwork operating system (IOS) software of the present invention and comprises circuitry or other hardware as is known in the art. In one exemplary embodiment, the CPU **12** comprises a MIPS R4000 CPU.

The RAM **14** may comprise random access memory or dynamic random access memory. The RAM **14** provides the main storage component for the router **10**. The RAM **14** is also referred to as working storage and contains the running configuration information of the router which is managed by the system database (sysDB) as described in further detail below. RAM **14** is volatile memory as is lost when power is interrupted to the router **10**.

The NVRAM **16** normally contains a persistent copy of the configuration information of the router. The configura-

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tion information includes, among other things, statements about router-specific attributes, protocol functions, and interface addresses. If power is interrupted to the router 10, the persistent copy of the configuration is provided to the router to provide normal routing operation without the need for reprogramming or reconfiguring.

The FLASH 18 is an erasable, programmable read-only memory which contains the internetwork operating system (IOS) software of the router 10. As is known in the art, flash memory has a structure that enables the flash to store multiple copies of the IOS software. Flash memory content is retained when power is interrupted from the router or the router is restarted.

The ROM 20 contains an initializing bootstrap program and is used during initial start up of the router 10. The ROM 20 usually carries out a power-on self-test (POST) to check the hardware components of the router 10 as is known in the art.

During start up, the router 10 conducts the POST check routine which is provided by the ROM 20. The POST check includes a diagnostic which verifies the basic operation of the CPU 12, the RAM 14, the NVRAM 16, the FLASH 18, and interface circuitry 22*a* through 22*n*. At the conclusion of the POST, the router 10 loads the IOS software from the FLASH 18 into the RAM 14. It will be appreciated that IOS software may be loaded using a variety of methods without deviating from the present invention including, for example, loading the IOS from an external source such as a TFTP server. The router configuration information is then loaded into RAM 14 from the NVRAM 16. More particularly, the configuration information is loaded into the database system in RAM 14. The configuration information for the router may also be loaded into RAM 14 using other means known in the art. The CPU 12 then proceeds to carry out the tasks required by the IOS.

Referring next to FIG. 2, there is shown a block diagram of an internetwork operating system (IOS) 24 in accordance with the present invention. The IOS 24 which is stored in the FLASH 18 provides the software functions and routines executed by the CPU 12 for the router device 10. The method of the present invention is preferably incorporated into the IOS software device and is executed by the CPU 12. FIG. 3 depicts a block diagram of an exemplary tree structure 42 for data storage which is used in conjunction with the IOS 24 as described herein.

The IOS 24 comprises a plurality of subsystem applications which are executed by the CPU 12 and are loaded and resident in RAM 14. The IOS 24 includes a system database (sysDB) 26 subsystem, a config subsystem 28 coupled to the sysDB 26, an Internet Protocol (IP) subsystem 30 coupled to the sysDB 26, an Ethernet subsystem 32 coupled to the sysDB 26, a dialer subsystem 34 coupled to the sysDB 26, an authentication (AAA) subsystem 36 coupled to the sysDB 26, and a point-to-point protocol (PPP) subsystem 38 coupled to the sysDB 26. It will be appreciated that the configuration shown for IOS 24 is only exemplary and various arrangements of subsystems as known in the art may be used with the method of the present invention. Thus, other subsystems 40 may be coupled to the sysDB 26 to provide additional functions. For example, a SONET subsystem may be coupled to the sysDB 26 to provide optical services.

The sysDB 26 manages a centralized database coupled therewith which is shown and generally designated as sysDB tree 42. The centralized database (sysDB tree 42) may comprise any data storage structure known in the art, and is preferably structured and configured as a tree format (FIG. 3). The sysDB tree 42 contains the running router configuration information used by the various subsystems to carry out their respective tasks.

The sysDB tree structure includes a plurality of branches and leaves which stem from the root configuration (cfg) 43, wherein each branch or leaf is treated as a node or "tuple". For example, FIG. 3 shows a portion of a sysDB tree 42 which includes seven (7) tuples for accommodating router configuration data. For example, Ethernet (E) 1/0 tuple 44 contains Internet address information for Ethernet Port 0 (not shown), and Ethernet (E) 1/1 tuple 46 contains Internet address information for Ethernet Port 1 (not shown). Each tuple includes a first "current" field for storing a current or "default" value associated with configuration information related to the tuple and a second "old" field for storing an "old" configuration value for the tuple. As described further below, the "old" field at a tuple will contain a value when a transaction is currently active on that tuple. When the "old" field value is empty or NULL at a tuple, a transaction is not associated with that tuple.

In certain cases, a plurality of values may be stored at a given tuple by providing an array of fields wherein each field of the array may accommodate a certain value. Other data structures for storing data at a tuple may also be implemented at a tuple without deviating from the present invention.

For router configuration data which is managed externally, the related tuple of the sysDB tree 42 may contain a cached (or local copy) of the external data. In such case, additional data may be provided at the tuple including a timeout period, after which the cached data becomes invalid, and must be "refreshed" (i.e., re-obtained from the managing subsystem). By caching the external data, performance of the sysDB can be improved at the cost of slightly stale data. Additional data provided at the tuple may also include an address (or function) from which the sysDB may obtain the external data from the managing subsystem.

In the preferred embodiment, each node or tuple in the sysDB tree has a pointer to its parent node, a pointer to its next peer, and a pointer to its first child. Thus, E 1/0 tuple 44 has a pointer to Address tuple 50 and to E 1/1 tuple 46. With this arrangement, all the children of a tuple can be iterated by using the first child as the head of a link list and traversing through the corresponding peer of each child.

The config subsystem 28 carries out the operation of receiving configuration commands for a user of the router, executing the configuration command received from the user and providing configuration information to the user of the router upon request from the user, among other things. As described above, this router configuration information is stored and managed by the sysDB 26 in the sysDB tree 42.

The IP subsystem 30 carries out the operation of providing wide-area connectivity using a set of protocols associated with Internet Protocol (IP). As is known in the art, the IP subsystem provides packet filtering and forwarding functions for the IP protocol.

A connector device (not shown) may be provided as one of the interface facilities 22*a* through 22*n* to connect Ethernet facilities to the router 10. The Ethernet subsystem 32 carries out the operation of providing packet filtering based on Ethernet MAC (Layer 2) or IP (Layer 3) addresses as is known in the art and packet forwarding as is known in the art.

The dialer subsystem 34 carries out the operation of providing dial-in connection services to a user of the router.

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To this end, the dialer subsystem initiates terminal reception of a user's access credentials, normally in the form of a name and a password.

The AAA subsystem **36** carries out the operation of authenticating the access credentials of users of the router. The AAA subsystem **36** verifies the name and password of the user, which is obtained from the dialer subsystem **34** and determines configuration data for the user as well as access privileges. Configuration data may include such information as the user's IP address, for example. The configuration data for the user is stored in the sysDB tree **42** by sysDB **26** via a transaction request from the AAA subsystem **36**.

The PPP subsystem **38** carries out the operation of providing Point-to-Point protocol services over a point-to-point link. As an aspect of providing Point-to-Point protocol services, the PPP subsystem **38** provides a method of encapsulating multi-protocol datagrams into an encapsulated protocol, provides a Link Control Protocol (LCP) which establishes, configures and test the point-to-point link, and provides a Network Control Protocol (NCP) using the encapsulated protocol, which is normally IP.

The sysDB **26** further includes an iterating function (not shown) for navigating to a particular tuple within the sysDB tree **42**. A tuple iterator is created for traversing the sysDB tree **42** and is destroyed after completion of its traversal operation. Preferably a tuple iterator does not lock any of the tuples over which it traverses.

Referring now to FIG. **4**, there is shown a block diagram generally depicting the relationship between a managing subsystem **48** and the sysDB **26** according to the present invention. A managing subsystem **48** is a subsystem of the IOS which carries out the operation of externally managing router configuration data as described herein.

As depicted, sysDB **26** further includes an external managing unit **51** coupled for communication to the sysDB tree **42**. The external managing unit **51** is further coupled for communication to a managing subsystem, if any. FIG. **4** depicts a single managing subsystem **48** coupled to the external managing unit **51**, although one or more other managing subsystems may also be coupled to the external managing unit **51** as described herein for the managing subsystem **48**. The external managing unit **51** carries out the operating of registering and unregistering managing subsystems (such as subsystem **48**) for external data managing services. The external managing unit **51** further carries out the operation of providing transaction access to such externally managed data to client subsystems (not shown) requesting such data.

Managing subsystem **48** includes a local managing unit **52** coupled for communication the external managing unit **51** of the sysDB **26** and a local data store **54**. The local managing unit **52** is coupled to the local data store **54** for managing the external router data maintained within the local data store **54** and providing the router data to the external managing unit **51** of the sysDB **26** upon request. The local managing unit **52** also carries out the operation of registering and unregistering with the sysDB **26** for external data managing services.

In operation, the one or more managing subsystem applications (such as subsystem **48**) may register for external data managing services with the sysDB subsystem **26**. During the registration, the subsystem identifies the tuple for which the subsystem is registering for external management. The system may also identify a name space (i.e., the sub-tree of a tuple) for which the subsystem would like to provide external management.

Upon registering, the requesting subsystem **48** indicates whether the externally managed data may be "cached" (locally copied) in the sysDB tree **42**, in which case the managing subsystem **48** may further indicate when the cached data expires (timeout). Alternatively, the managing subsystem **48** may, during operation, invalidate the cached data. The managing subsystem **48** further indicates a lookup address (or function) from which the sysDB **26** may obtain the externally managed data from the managing subsystem **48**.

When a request is made to the sysDB **26** for data which is externally managed, the sysDB **26** provides the requested data from the cache if the data is resident in the cache and the data has not expired (or otherwise been invalidated). For other data (non-cached or expired data), the sysDB **26** accesses the lookup address (or function) to provide the data value requested by the requesting subsystems.

The method and operation of invention will be more fully understood with reference to the flow charts of FIG. **5** through FIG. **8**, as well as FIG. **1** through FIG. **4**. FIG. **5** is a flow chart showing generally the actions involved in registering for external data managing services in accordance with the present invention. FIG. **6** is a flow chart showing generally the actions involved in unregistering from external data managing services in accordance with the present invention. FIG. **7** is a flow chart showing generally the actions involved in handling a request transaction in accordance with the present invention. FIG. **8** is a flow chart showing generally the actions involved in handling a change transaction in accordance with the present invention. The order of actions as shown in FIG. **5** through FIG. **8** and described below is only exemplary, and should not be considered limiting.

Referring now to FIG. **5**, as well as FIG. **1** through FIG. **4**, there is shown generally the actions associated with registering a subsystem for external data management. Prior to the registration sequence described herein, the managing subsystem **48** creates the data store **54** for storing the externally managed router data. The data store **54** may be any conventional data store (such as table) for storing data as is known in the art.

At box **100**, a managing subsystem **48** (via local managing unit **52**) issues a management registration request to the sysDB **26** for external management services. This request will indicate, among other things, the configuration data (tuple) for which the managing subsystem **48** is registering external management and whether the subsystem is registering for management of a "name space" which includes the sub-tree data associated with the tuple. Additionally, the managing subsystem **48** indicates an address (or function) from which the sysDB **26** may obtain the external router data maintained by the managing subsystem **48**. The managing subsystem **48** may also indicate whether the external data may be cached (or locally copied) to the sysDB tree **42**, and a timeout period after which the cached data becomes invalid and must be refreshed by accessing the address (or function) once again. Box **110** is then carried out.

At box **110**, the sysDB **26** receives the registration request of step **100**. In response to this request, the sysDB **26** calls a tuple iterator function to find the location of the tuple for which registration is requested. The iterator function searches the sysDB tree **42** starting at the root (cfg) **43** to ascertain the location of the requested tuple. Diamond **120** is then carried out.

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At diamond 120, the iterator function determines whether the requested tuple was found during the search of box **110**. If the tuple is not found, box **130** is carried out. Otherwise, box **140** is carried out.

At box **130**, the iterator function was not able to find the requested tuple in the sysDB tree **42**. The absence of a tuple indicates that data for that tuple currently is not available. However, since some of the configuration data maintained in the sysDB **26** is generated dynamically during the operation of the router, the tuple may contain configuration data at some later time during the operation of the router. Thus at box **130**, a tuple associated with the present registration request is created in the sysDB tree **42**. The value for this newly created tuple is not set since data is maintained externally. Box **140** is then carried out.

At box **140**, the sysDB **26** registers external management for the requested tuple. The sysDB **26** sets the tuple has external manager flag to indicate the requesting managing subsystem from box **100** will carry out external router data management for the requested tuple. Box **150** is then carried out.

At box **150**, the sysDB **26** defines the address (or function) from which the sysDB **26** retrieves the actual value of the router data which is externally managed. The address (or function) is provided by the registration request of box **100** and is set at the requested tuple. Diamond **160** is then carried out.

At diamond **160**, the sysDB **26** determines whether the registration request of step **100** included a request to cache the externally managed data within the tuple. If so, box **170** is carried out. Otherwise box **190** is carried out.

At box **170**, the sysDB **26** creates a tuple data store for the cache value at the requested tuple. The tuple data store holds the cache value for the externally managed data. Box **180** is then carried out.

At box **180**, the sysDB **26** defines the cache timeout value after which the cached value becomes invalid. Alternatively, the managing subsystem **48** may proactively invalidate the cache value. Once the cache value is invalid, the sysDB **26** must request the actual value from the managing subsystem as described further in conjunction with FIG. **7** below. Box **190** is then carried out.

At box **190**, the registration is completed. The sysDB **26** will transmit an acknowledgment to the requesting subsystem to indicate that its registration for external management was successful.

Referring next to FIG. **6**, as well as FIG. **1** through FIG. **4**, there is shown generally the actions associated with unregistering a managing subsystem from external data management. Once a subsystem is unregistered with the sysDB **26**, the subsystem no longer carries out external data management of sysDB tree **42** tuple data.

At box **200**, a subsystem issues a management unregistration request to the sysDB **26**. This request indicates the router configuration data for which unregistration is requested. Box **210** is then carried out.

At box **210**, the sysDB **26** receives the unregistration request of box **200**. In response to this request, the sysDB **26** calls a tuple iterator function to find the location of the tuple for which unregistration is requested. The iterator function searches the sysDB tree **42** starting at the root (cfg) **43** to ascertain the location of the requested tuple. Diamond **220** is then carried out.

At diamond **220**, the iterator function determines whether the requested tuple was found during the search of box **210**. If the tuple is not found, box **230** is carried out. Otherwise, box **240** is carried out.

At box **230**, the iterator function was not able to find the requested tuple in the sysDB tree **42**. The absence of a tuple for unregistration is interpreted as an error because unregistration is proper only when a prior registration was made which would have involved the creation of the requested tuple. Since the iterator function did not find the requested tuple, the unregistration request is improper and an error message is displayed to the user to indicate an unregistration error.

At box **240**, the sysDB **26** removes the management registration from the requested tuple by deleting the tuple has external manager flag. Once management registration is removed or otherwise deleted, the requesting subsystem of box **200** will no longer manages router data externally from the sysDB **26**. Box **250** is then carried out.

At box **250**, the sysDB **26** removes or otherwise deletes the address (or function) from which the sysDB **26** access the externally managed data from the managing subsystem **48**. Diamond **260** is then carried out.

At diamond **260**, the sysDB **26** determines whether the externally managed data was cached in the requested tuple. If externally managed data was cached, box **270** is carried out. Otherwise, box **275** is carried out.

At box **270**, the sysDB **26** has determined that the externally managed data was cached at the requested tuple. The sysDB **26** removes the cache timeout for the requested tuple. Box **280** is then carried out.

At box **275**, the sysDB **26** has determined that the externally managed data was not cached at the requested tuple. Since router data will now be managed locally at the sysDB tree **42**, storage for tuple data will be required. The sysDB **26** creates a tuple data store for the router value at the requested tuple. Box **280** is then carried out.

At box **280**, the sysDB **26** sets the tuple current value to the most recent value for the tuple. Alternatively, the tuple may be set to the "no data" state. Box **290** is then carried out.

At box **290**, the unregistration is complete. The sysDB **26** will transmit an acknowledgment to the requesting subsystem to indicate that its management unregistration request was successful.

Referring next to FIG. **7**, as well as FIG. **1** through FIG. **4**, there is generally shown the actions associated with handling transactions in accordance with the present invention. In the following example, the transaction illustrated is a "tuple query request" where a subsystem is requesting the value of router data from the sysDB **26**. FIG. **8** describes a change or modify transaction request further below.

At box **300**, a subsystem issues a tuple query request to the sysDB **26**. Box **310** is then carried out.

At box **310**, the sysDB **26** receives the tuple query request of box **300** and ascertains the location of the tuple in the sysDB tree **42**. The sysDB **26** calls a tuple iterator function to find the location of the tuple for which a change is requested. The iterator function searches the sysDB tree **42** starting at the root (cfg) **43** to ascertain the location of the requested tuple. Diamond **320** is then carried out.

At diamond **320**, the iterator function determines whether the requested tuple was found during the search of box **310**. If the tuple is not found, diamond **340** is carried out. Otherwise, box **330** is carried out.

At box **330**, the iterator function was not able to find the requested tuple in the sysDB tree **42**. The absence of a tuple for change or update is interpreted as an error because a query transaction at a tuple is proper only if the tuple was previously created. Since the iterator function did not find

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the requested tuple, the query request is improper and an error message is displayed to the user to indicate a query request error.

At diamond 340, the sysDB 26 determines whether the requested tuple has its "tuple has external manager" flag set. If the "tuple has external manager" flag is set, then a managing subsystem is registered to manage the requested data externally from the sysDB 26. If the "tuple has external manager" flag is set at the requested tuple, then diamond 360 is carried out. Otherwise, box 350 is carried out.

At box 350, external management is not provided at the requested tuple and the transaction is carried out using the method described in copending application entitled METHOD AND SYSTEM FOR EXECUTING, TRACKING AND RESTORING TEMPORARY ROUTER CONFIGURATION CHANGE USING A CENTRALIZED DATABASE, filed Oct. 12, 1999, which is incorporated herein by reference. In the present example, where the transaction is a query request, the sysDB 26 provides the data from the tuple. Box 440 is then carried out.

At diamond 360, external management is provided at the requested tuple. The sysDB 26 determines whether cached data is provided at the requested tuple. If external data is cached at the requested tuple, then diamond 380 is carried out. Otherwise box 370 is carried out.

At diamond 380, the sysDB 26 determines whether the cached value for the external data is still valid. If the cache timeout has not yet expired, and the managing subsystem 48 has not otherwise invalidated the cache value, then box 390 is carried out to provide the cache value. Otherwise box 370 is carried out.

At box 390, the sysDB 26 has determined that the cache value is still valid and provides this cache value to the requesting subsystem of box 300 in response to the query request. Box 400 is then carried out.

At box 370, the sysDB 26 has determined that either the cache value is invalid or that cache data is not provided at the requested tuple. In either case, the external managing unit 51 accesses the address (or function) from which data may be retrieved from the managing subsystem 48 registered at the requested tuple. The sysDB 26 then provides the ascertained data value to the requesting subsystem of box 300 in response to the query request. Box 400 is then carried out.

At box 400, the request transaction has been completed. The process described herein is carried out for each such request transaction made to the sysDB 26.

Referring now to FIG. 8, as well as FIG. 1 through FIG. 4, there is generally shown the actions associated with handling change or modify transactions in accordance with the present invention.

At box 410, a subsystem issues a tuple query request to the sysDB 26. Box 420 is then carried out.

At box 420, the sysDB 26 receives the tuple query request of box 410 and ascertains the location of the tuple in the sysDB tree 42. The sysDB 26 calls a tuple iterator function to find the location of the tuple for which a change is requested. The iterator function searches the sysDB tree 42 starting at the root (cfg) 43 to ascertain the location of the requested tuple. Diamond 430 is then carried out.

At diamond 430, the iterator function determines whether the requested tuple was found during the search of box 420. If the tuple is not found, diamond 450 is carried out. Otherwise, box 440 is carried out.

At box 440, the iterator function was not able to find the requested tuple in the sysDB tree 42. The absence of a tuple for change or update is interpreted as an error because a change transaction at a tuple is proper only if the tuple was previously created. Since the iterator function did not find the requested tuple, the change request is improper and an error message is displayed to the user to indicate a change request error.

At diamond 450, the sysDB 26 determines whether the requested tuple found in box 420 has verification registrations. If a tuple has verification registrations, subsystems that are registered for "verification" at the tuple must first authorize changes before such changes are permitted. Verification registrations are described in further detail in copending application entitled METHOD AND SYSTEM FOR VERIFYING CONFIGURATION TRANSACTIONS MANAGED BY A CENTRALIZED DATABASE filed on Oct. 12, 1999 which is incorporated by reference herein. If verification registrations exist at the requested tuple then box 460 is carried out. Otherwise diamond 490 is carried out.

At box 460, the sysDB 26 determines that the requested tuple has verification registrations. The sysDB 26 then calls the verification handler routine which either authorizes or denies a change request. The verification handle routine is described further in copending application entitled METHOD AND SYSTEM FOR VERIFYING CONFIGURATION TRANSACTIONS MANAGED BY A CENTRALIZED DATABASE filed on Oct. 12, 1999. Diamond 470 is then carried out.

At diamond 470, the sysDB 26 receives a reply from the verification handler routine. The verification handler will return a "success" reply for authorized changes, or an "error" reply for unauthorized changes. If a "success" reply is issued, diamond 490 is carried out to set the tuple value. Otherwise box 480 is carried out to generate an error message.

At box 480, the verification handler returned an "error" in response to proposed changes. An error message is generated and is displayed to the user.

At diamond 490, the sysDB 26 determines whether the requested tuple has its "tuple has external manager" flag set. If the "tuple has external manager" flag is set, then a subsystem is registered to manage the requested data externally from the sysDB 26. If the "tuple has external manager" flag is set at the requested tuple, then diamond 510 is carried out. Otherwise, box 500 is carried out.

At box 500, external management is not provided at the requested tuple and the transaction is carried out using the method described in copending application entitled METHOD AND SYSTEM FOR EXECUTING, TRACKING AND RESTORING TEMPORARY ROUTER CONFIGURATION CHANGE USING A CENTRALIZED DATABASE, filed Oct. 12, 1999, which is incorporated herein by reference. In the present example, where the transaction is a change request, the sysDB 26 sets the value at the requested tuple. Box 540 is then carried out to carry out notification sequence.

At diamond 510, external management is provided at the requested tuple. The sysDB 26 determines whether cached data is provided at the requested tuple. If external data is cached at the requested tuple, then box 520 is carried out. Otherwise box 530 is carried out.

At box 520, the sysDB 26 has determined that external management is provided at the requested tuple. To effect the current change request, the sysDB 26 updates the cached value to the requested changed value. Box 530 is then carried out.

At box 530, the sysDB 26 requests a data change to the external managing subsystem to effectuate the change externally. In response to this requests, the managing subsystem

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48 updates the local data store 54 to reflect the changed value. Box 540 is then carried out to carry out notification.

At box 540, the sysDB 26 executes the notification routine which notifies registered subsystems of changes made to the requested tuple. Copending application entitled SUBSYSTEM APPLICATION NOTIFICATION METHOD IN A CENTRALIZED ROUTER DATABASE, filed Oct. 12, 1999 describes in further detail the method for carrying out router configuration change notifications in conjunction with a centralized database and is incorporated by reference herein.

Accordingly, it will be seen that this invention provides a method for externally managing router data in conjunction with a centralized database system. Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing an illustration of the presently preferred embodiment of the invention. Thus the scope of this invention should be determined by the appended claims and their legal equivalents.

What is claimed is:

1. A method for reducing computational overhead in a centralized database system by externally managing router data in conjunction with a centralized database subsystem, said database subsystem operatively coupled for communication with a plurality of router subsystems one of which is a first managing subsystem, comprising:

a) transmitting a management registration request by said first managing subsystem to said database subsystem, said registration request indicating router configuration data for which said first managing subsystem is requesting to provide external management services, said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database;

b) receiving said management registration request by said database subsystem; and

c) registering said first managing subsystem for external management by said database subsystem.

2. The method of claim 1 further comprising maintaining router configuration data using a tree structure having a plurality of tuples by said database system.

3. The method of claim 2 wherein said registering said managing subsystem for external management further comprises:

(a) finding a requested tuple for which external management is requested; and

(b) defining an address to access external router data from said first managing subsystem at said requested tuple.

4. The method of claim 3 wherein said registering said managing subsystem for external management further comprises caching said external router data at said requested tuples.

5. The method of claim 1 further comprising:

a) transmitting a query request for router data by a requesting subsystem to said database subsystem;

b) receiving said query request by said database subsystem;

c) determining whether said router data is externally managed by a second managing subsystem;

d) accessing said router data from said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem; and

e) providing said router data to said requesting subsystem.

6. The method of claim 1 further comprising:

(a) transmitting a query request for router data by a requesting subsystem to said database subsystem;

(b) receiving said query request by said database subsystem;

(c) determining whether said router data is externally managed by a second managing subsystem;

(d) determining whether said router data is locally cached when said database subsystem determines said router data is externally managed by a second managing subsystem;

(e) determining whether said cache value is valid when said database subsystem determines said router data is locally cached;

(f) determining cache value of router data when said cache value is valid; and

(g) providing said cache value to said requesting subsystem when said cache value is valid.

7. The method of claim 6 further comprising:

a) accessing said router data from said managing subsystem by said database subsystem when said cache value is not valid; and

b) said database subsystem providing said router data to said requesting subsystem when said cache value is not valid.

8. The method of claim 1 further comprising:

(a) transmitting a change request for router data by a requesting subsystem to said database subsystem;

(b) receiving said change request by said database subsystem;

(c) determining whether said router data is externally managed by a second managing subsystem; and

(d) requesting a data change for said router data to said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem.

9. The method of claim 8 further comprising:

a) determining whether said router data is locally cached; and

b) updating the cache value to said router data when said router data is locally cached.

10. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for reducing computational overhead in a centralized database system by externally managing router data in conjunction with a centralized database subsystem, said database subsystem operatively coupled for communication with a plurality of router subsystems one of which is a first managing subsystem, said method comprising:

(a) transmitting a management registration request by said first managing subsystem to said database subsystem, said registration request indicating router configuration data for which said first managing subsystem is requesting to provide external management services, said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database;

(b) receiving said management registration request by said database subsystem; and

(c) registering said first managing subsystem for external management by said managing subsystem.

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11. The program storage device of claim 10, said method further comprising maintaining router configuration data using a tree structure having a plurality of tuples by said database system.

12. The program storage device of claim 11, wherein said registering said managing subsystem for external management further comprises:

(a) finding a requested tuple for which external management is requested; and

(b) defining an address to access external router data from said first managing subsystem at said requested tuple.

13. The program storage device of claim 12, wherein said registering said managing subsystem for external management further comprises caching said external router data at said requested tuples.

14. The program storage device of claim 10, said method further comprising:

(a) transmitting a query request for router data by a requesting subsystem to said database subsystem;

(b) receiving said query request by said database subsystem;

(c) determining whether said router data is externally managed by a second managing subsystem;

(d) accessing said router data from said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem; and

(e) providing said router data to said requesting subsystem.

15. The program storage device of claim 10, said method further comprising:

(a) transmitting a query request for router data by a requesting subsystem to said database subsystem;

(b) receiving said query request by said database subsystem;

(c) determining whether said router data is externally managed by a second managing subsystem;

(d) determining whether said router data is locally cached when said database subsystem determines said router data is externally managed by a second managing subsystem;

(e) determining whether said cache value is valid when said database subsystem determines said router data is locally cached;

(f) determining cache value of router data when said cache value is valid; and

(g) providing said cache value to said requesting subsystem when said cache value is valid.

16. The program storage device of claim 15, said method further comprising:

(a) accessing said router data from said managing subsystem by said database subsystem when said cache value is not valid; and

(b) said database subsystem providing said router data to said requesting subsystem when said cache value is not valid.

17. The program storage device of claim 10, said method further comprising:

(a) transmitting a change request for router data by a requesting subsystem to said database subsystem;

(b) receiving said change request by said database subsystem;

(c) determining whether said router data is externally managed by a second managing subsystem; and

(d) requesting a data change for said router data to said second managing subsystem by said database subsystem when said database subsystem determines said router data is externally managed by a second managing subsystem.

18. The program storage device of claim 17, said method further comprising:

(a) determining whether said router data is locally cached; and

(b) updating the cache value to said router data when said router data is locally cached.

19. In a router device having a processor and memory, a router operating system executing within said memory comprising:

(a) a database subsystem;

(b) a plurality of client subsystems, each operatively coupled for communication to said database subsystem, one of said client subsystems configured as a managing subsystem to externally manage router data upon issuing a management request to said database subsystem; and

(c) a database operatively coupled to said database subsystem, said database configured to store router configuration data and delegate management of router configuration data to a management subsystem that requests to manage router configuration data, said router configuration data managed by said database system and derived from configuration commands supplied by a user and executed by a router configuration subsystem before being stored in said database.

20. The router operating system of claim 19 wherein said database subsystem is structured and configured as a tree structure having a plurality of tuples.

21. The router operating system of claim 19 wherein said database subsystem further comprises an external managing unit configured to access external router data from said managing subsystem.

22. The router operating system of claim 19 wherein said managing subsystem further comprises:

(a) a local managing unit; and

(b) a data store unit structured to store external router data for said managing subsystem, said local managing unit configured to provide external router data from said data store to said database subsystem.

* * * * *

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CERTIFICATE OF SERVICE

I certify that on September 23, 2016, I electronically filed the foregoing Principal Brief of Appellant using the Court's CM/ECF filing system. Counsel for appellee were electronically served by and through the Court's CM/ECF filing system per Fed. R. App. P. 25 and Fed. Cir. R. 25(a) and 25(b).

/s/ Lauren A. Degnan
Lauren A. Degnan

CERTIFICATE OF COMPLIANCE

The Principal Brief of Appellant is submitted in accordance with the type-volume limitation of Rule 32(a)(7)(B) of the Fed. R. App. P. The Brief contains 13,984 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii) and Fed. Cir. R 32(b). This Brief has been prepared in a proportionally spaced typeface using Microsoft Word 2010 in Times new Roman, 14 Point.

Dated: September 23, 2016

/s/ Lauren A. Degnan
Lauren A. Degnan